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NEWS

IRS systems overdrawn

GAO estimates upcoming overhaul at \$3B to \$4B

BY MITCH BETTS
OF WASH.

WASHINGTON, D.C. — The single biggest management challenge facing the Internal Revenue Service is replacement of its aging computer systems for tax processing, the U.S. General Accounting Office (GAO) told a congressional hearing last week.

The report presented Sen. David Pryor (D-Ark.), who chaired the hearing, to declare that the outdated IRS computer systems are headed for a "train wreck" in the mid-1990s.

The IRS, acknowledging that its 1980-era systems are insufficient and will run out of capacity between 1992 and 1994, has launched a major replacement program called the Tax System Redesign. The GAO estimated the cost at between \$3 billion and \$4 billion.

Pryor questioned whether the IRS would be able to handle such a big project in light of audits showing poor financial control and mistakes in other computer projects.

So far, the Tax System Redesign has been slow going, and the

date for full-scale implementation has slipped from 1995 to 1998, Pryor said.

"This modernization is a massive undertaking, even compared with many of the large systems we hear about in government and industry today," the GAO spokesman testified. The GAO suggested that one executive be given full-time responsibility for managing the technology overhaul and that the IRS raise the technical expertise of all its senior managers.

"IRS has preliminary design concepts," the GAO observed, "but the real work of modernization is still ahead." The design envisions a corporate database for widely used tax administration information, departmental systems for department-specific information, a nationwide network, electronic filing of tax returns and optical-disk storage.

The IRS wants the new system to be portable, flexible and expandable. "Our current system is none of those things," said Margaret O'Rourke, director of information systems design at the IRS office, at a conference last year.

1-2-3 Release 3.0 bound for 5,000 beta-test sites

BY DOUGLAS BARNEY
OF WASH.

CAMBRIDGE, Mass. — Lotus Development Corp. launched what may be the largest beta test ever when it shipped out prerelease copies of 1-2-3 Release 3.0 last week.

The massive beta-test release is the first good news for the firm since it was besieged by product delays and criticized by an increasingly skeptical user base. Since early last year, Lotus' image as a technology leader has been harmed by unfulfilled promises. This could change with a warm Release 3.0 reception.

Barring unforeseen bugs, the product — announced 23 months ago — should make its June 1989 deadline. Lotus and its 5,000 corporate testers now have three months to test, debug and shrink-wrap the long-awaited upgrade.

Despite some user defections and growing uneasiness, Lotus customers remain a loyal lot. Many are so familiar with 1-2-3 that switching to another product would be like getting a divorce, said Ron Goldfarb, a new-technology evaluator at Frost & Whitely.

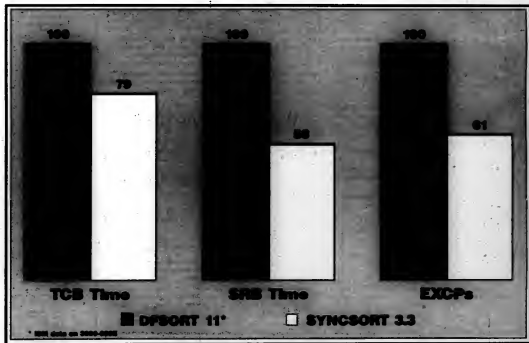
Lotus has forked millions in upgrade fees to hang onto users. The firm has been offering a free upgrade to Release 3.0 for all Release 2.01 purchases since September 1988.

Like General Motors Corp. putting cars on the showroom floor but refusing to open the hood, Lotus is still providing scant Release 3.0 details, such as what hardware is required to run the product. However, industry sources and a Lotus insider concede that the MS-DOS version will require a so-called DOS Extender and will not run on Intel Corp. 8088-based machines. Lotus concedes that it is targeting Intel 80286 machines and above but will not confirm the DOS Extender component.

DOS Extenders allow MS-DOS programs to take advantage of the protected mode of the 286 and 386, a feature that provides memory greater than 640K bytes. The software will also run under OS/2 and may be able to run IBM's upcoming OS/2 applications (J-1).

Dick Wages shipping to an initial group of 70 sites last week. That group will be expanded to include more than 5,000 users, according to Lotus officials.

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DISCUSSION

IBM shines up AS/400 family

BY ROSEMARY HAMILTON
in New York

IBM polished up its Application Systems/400 line with a host of options last week, including expanded I/O and capabilities, memory price cuts on memory upgrades for higher and middle and a high-end system.

But users and consultants contacted last week said the announcement was no ordinary introduction of enhancements. Instead, they claimed, it was IBM's response to reports of performance problems that are showing up on all models of the AS/400 when users run the systems with standard memory configurations.

An IBM spokesman said he

was aware of industry speculation about the AS/400's performance problems but said it was "absolutely not true."

Users and consultants said the AS/400, with its rich and complex operating system, has proven to need more than the standard or typical amount of memory. This problem surfaced last year at the low end when machines were running with minimum memory configurations. But observers now say that higher-end models will also slow down when running more complex applications such as AS/400 Office.

The IBM spokesman said last year's reports of a low-end memory problem was a separate issue involving customers not running

in native mode. He added that there have been no reports of problems on higher-end models. "Nobody said they weren't getting expected performance on a B30 or above," he said.

"We're upgrading our memory now to get more efficiency out of Office," said Ron Cipolla, IBS director at Kendall Co. in Boston, which is running an assortment of AS/400 models. "It was running poorly, but we hadn't originally configured our systems to include Office."

Many have been problems Cipolla said that he does not believe IBM had a big problem on its hands but that other users may have encountered difficulties. "Anytime IBM drops memory prices this early in a product's life, you could believe there's been problems," he claimed.

John Logan, an analyst at Aberdeen Group in Boston, said IBM "essentially tried to do too much" with the AS/400. "The problem comes when running multiple applications, particularly Office. The memory just can't swing programs in and out fast enough," he said.

Logan and other observers pointed to several pieces of last week's announcement that can be seen as IBM's way of correcting problems.

For example, the maximum memory configuration of the B10 and B20 models — the source of user woes last year — has been officially boosted. The maximum configuration on a B10 is now 16M instead of 8M bytes. The B20's maximum memory can be boosted from 16M to 28M bytes.

Last year, several B10 and B20 users complained to IBM that they suffered poor performance

Branching out

IBM's expanded AS/400 Model B20 increases user options for memory, storage and I/O cards

Main storage (in bytes)	4.1M to 1.6M	4.1M to 28M
Number of system I/O buses	1	3
Number of available card slots	4	9
DASD capacity (in bytes)	630M to 948M	630M to 2.3G
Typical number of users	6 to 30	13 to 30
Price	\$44,500	\$83,500

Includes operating system, disk and tape

SOURCE: IBM

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Reaching up

Where further options become available, the AS/400 Model 70 will offer more memory, more workstations attached and more communication lines than the Model 60

Relative performance ¹	5.5	7.9
Main storage (in bytes)	33M to 94M	33M to 94M
Maximum number of I/O card slots	71	71
Maximum DASD capacity (in bytes)	37.3G	37.3G
With 9332 Model 400	38.4G	38.4G
With 9332 Model 600 ²		
Maximum number of workstation controllers	12	15 ³
Maximum number of communication lines	32	48 ⁴
Price (includes operating system)	\$284,500	\$379,000

¹ Model 60 is 10M byte mode memory, 9332 Model 400 is 33M byte mode memory. ² Model 600 is 33M byte mode memory. ³ Model 600 is 33M byte mode memory. ⁴ Model 600 is 33M byte mode memory.

SOURCE: IBM

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PC Systems pulls out of Leading Edge deal

BY ALAN J. RYAN
in Irvine

RIVERVIEW BEACH, Fla. — Steven Gray, owner of PC Systems, Inc., last week withdrew his offer to purchase the Leading Edge name and logo from financially troubled personal computer closer Leading Edge Products, Inc. in Canton, Mass.

Gray had originally agreed to pay \$921,000 for the Leading Edge name and logo, which was specifically the most recent Leading Edge owned him when it stopped shipping computers to dealers who had prepaid for them earlier this year.

Gray said the deal collapsed when Steven Gray, managing director of a Boston-based financial consulting firm and the court-appointed Chapter 11 trustee for Leading Edge, did not agree to the new terms he proposed, which included allowing him to ship to dealers some

\$16 million worth of Leading Edge computers that are currently warehoused in Los Angeles.

According to Paxon, Gray told him he should send \$5 million to \$10 million to Leading Edge to secure the release of these machines and that Leading Edge technicians would handle the distribution.

Paxon said he would be to accept Gray's terms. "It is very peculiar that you throw a life raft to a drowning man and the drowning man says it isn't a good enough life raft," Paxon said.

In a proposed statement, Gray said his immediate objective was to engage a managing agent to work on his behalf to find and operate the firm until a reorganization plan is confirmed by the U.S. Bankruptcy Court.

"This approach could result in the agent's eventual ownership of Leading Edge Products," Gray said.

Exec says SAA office tools imminent

BY STANLEY GIBSON
in New York

ATLANTA — IBM is set to announce an integrated office software package soon that is complementary with its Systems Application Architecture, according to IBM Vice-President Earl Wheeler, who has primary responsibility for SAA.

Although the widely anticipated software is often referred to as SAA Office, Wheeler did not use that name, nor did he elaborate on what he meant by "soon." An IBM spokesman declined to comment on Wheeler's remarks but did say that such an announcement is planned for this week.

Wheeler described the integrated software as the "first integrated SAA product" while

speaking at the general session of the KnowledgeWare, Inc. User Conference here last week. The executive told some 800 attendees that the software will offer document preparation, electronic mail, decision support and an iconic interface. In addition, it reportedly will have documented interfaces and will contain "the next level" of Common User Access, a graphical user interface.

Independent software vendors will have many applications ready the day the office software is announced, Wheeler said. Peter Morgan, vice-president of marketing at Software 2000, a Roswell, Minn.-based vendor of financial and business services software for the AS/400, said his firm will attend the announcement, although he could not specify the date. Software 2000

is a member of the IBM Business Partner program.

Morgan said he attended a briefing given over IBM's field television network for IBM personnel and business partners last week. During the broadcast, IBM sales representatives were advised they could begin selling the office software to customers.

Morgan said the broadcast also discussed AS/400 Debt/ Credit benchmark results that IBM has in hand. According to IBM spokesman denied that the company has conducted Debt/ Credit benchmark tests on the AS/400, one analyst said IBM intended to claim that the results are "IBM says they have them but won't release them," said John Logan, executive vice-president at Aberdeen Group in Boston.



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NEWS SHORTS

Apple litters Apple

A pop line of the 1980s took on a pop line of the 1990s last week when the company that produces the Beatles, Apple Corps Ltd., used Apple Computers, Inc., for obtaining a licensing agreement. Apple Corps, parent company of the Beatles' Apple Records, changed to a London center that it granted Apple Computer permission to use the Apple name in 1981 under a single condition — that the computer vendor not get into the music business. Apple Records, which announced last week that it bought back the 1980s pop line, may have moved directly into the music field, but its partners have used Macintosh-style Apple II computers to create music.

HP defines edge over AS/400

Hewlett-Packard Co. knew Intel last week how the benchmark with the release of last results that HP says beat the IBM Architecture System/400. The company put its HP 9000/730 on par with an AS/400 Model 900 in a benchmark test. The test results showed that the HP system was faster than the AS/400, while the IBM end-user report says it is faster. HP said it plans to use the test to show the IBM System/400 is not a true benchmark. IBM denied HP's contention that without a standard Doherty/Clark test, results are not necessarily comparable.

HP wants standards

In other news, HP said it will tap into worldwide standards research by spending \$25 million last week the next three years on data science projects, at which HP will voluntarily participate with other companies. The first center will open next month at Stanford University. Stanford will focus on artificial intelligence, distributed technology and control networks, HP said. The other centers will be held in Europe and along the Pacific Rim during the next two years. Other's goal is to fund funding of university research. HP said the center will spend \$25 million on technology research from research.

Pentest not targets heavy users

AT&T last week announced Private Pentest Network Service, a public packet-evolved offering that targets high-volume users with the cost advantages and network management features of a private network. In contrast to AT&T's existing Account packet-switched service, which levies no-sensitive charges, the new service carries a flat monthly fee for dedicated traffic, as AT&T spokeswoman said. Users can use the service and configure their networks from an on-premise IBM Personal Computer, she added. Scheduled for release in the third quarter, the as-yet unnamed service will also provide a portion of the U.S. General Services Administration's (GSA) Federal Telecommunications System 2000 network.

One FTS-2000 protest rejected

MCI Communications Corp.'s protest of the FTS-2000 contract awarded to AT&T was dismissed last week by the GSA's Board of Contract Appeals (CBA). The board said MCI had not meeting to protest because it was holding up a submission to MCI's Information Corp. for the federal security network. MCI's protest is a separate protest that Martin Marietta filed with the GSA contracting office, rather than with the Board of Contract Appeals.

Codex demonstrates

Codex, Inc., a midsize-based computer-aided design software vendor based in Portland, Ore., last week introduced a hardware-independent computer-aided design, manufacturing and engineering (CAM/DMU) application. Product-based Codex will now use a file-based architecture from Apple Computer, Inc., IBM, and the Information, Inc. The company also provided a file-based architecture design software to IBM. The source was intended to help manufacturers use CAD/CAM/DMU software on the 30-bit file architecture level.

Customs net seals U.S. border

BY ELISABETH HORWITT
OF STAFF

WASHINGTON, D.C. — Walter Curran, a Boston stockbroker who was recently charged with federal mail and bank fraud, escaped to Canada — but was apprehended at a border station on his way back to the U.S. Chalk up another triumph to law, order and the U.S. Customs Consolidated Data Network.

The network, a recently upgraded version of the 19-year-old Customs Law Enforcement system, links border agents to Customs' data center near Washington, D.C., letting them know whether the vehicle approaching their station is likely to contain a harmless tourist, an armed drug runner — or a possible white-collar criminal on the lam. For example, when the border inspector entered Curran's Massachusetts driver's license into his terminal, the system quickly provided information on the broker's arrest warrant, a Customs spokesman said.

Mishmash the crooks

"The object of the system is to provide [Customs] agents with as much information as possible: The more they get, the better armed they are," said R. Gary Curran, director of the operations division of U.S. Customs' Office of Data Systems. "Crooks are getting more modern weapons, so we need to do as well."

The original drug enforcement system began almost two decades ago as a pilot project in San Diego, near the Mexican border. It was "very much a homegrown effort," consisting of line-oriented asynchronous terminals, internally developed software, a Burroughs Corp. mainframe and a database gathered from the records of the lo-

cal Bureau of Motor Vehicles, according to network section leader Charles Dales. The network now serves the entire U.S. border, including airports. Approximately 3,000 terminals participate in the network.

In September 1987, the Office of Data Systems initiated a

Alcohol, Tobacco and Firearms and some miscellaneous Treasury Department agencies are scheduled to be on the network.

The new system is already said to provide more complete data, faster. Higher bandwidth (formerly 300 bps/sec, now up to 56K bps/sec) has cut response



U.S. Customs' 'Control' uses computers to patrol the borders

time down to three seconds at airports, Curran said. A single query to the new system can result in a 20- to 30-minute response that identifies the person or vehicle, what he is suspected of, what business he is in and past convictions, according to Jerry Dowell, Customs data center senior consultant. "The old system was designed to pass succinct messages," Dowell said.

An enhancement is planned that notifies agencies in other countries if a suspect is heading their way, Dowell said. Law enforcement agencies will also be able to swap data with other government agencies as they come on-line, Dowell said. For example, a border inspector might find out if an identified suspect is in the Federal Bureau of Investigation's files.

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DEC's water-cooled host still afloat, sources say

BY JAMES DALY
OF STAFF

MAYNARD, Mass. — Reports that Digital Equipment Corp.'s water-cooled mainframe project were shelved may have been premature, and the company may release the machine by the end of the year, according to sources close to the company.

In November, both a report by the FTS, Inc. research firm and a DEC internal memo stated that plans for the water-cooled system, code-named Aquarius, were scrapped because the company felt it could achieve acceptable performance with an air-

cooled, less-powerful model, code-named Ardis, and get it to market faster.

But DEC is reportedly still wants to the idea and is tinkering with two versions of Aquarius, each sporting a different cooling arrangement, sources said. The first is a field-to-air system conceptually similar to an automobile radiator; a second field-to-field model would be ship-compatible with an IBM 3090 thermal-conduction system.

Aquarius will reportedly process 30 million instructions per second (MIPS) and support up to four CPUs. Additional features would include a 1 Gb/sec in-

ternal system bus, 256M to 3G bytes of memory, a 16-msec clock speed and a choice of vector accelerators or vector CPUs, sources said.

Additionally, the machine will be capable of providing 125 million floating-point operations per second (MFLOPS) peak performance with a vector accelerator or 250 MFLOPS with a vector CPU. Pricing will be between \$1 million and \$4 million, depending on the number of CPUs.

In such a configuration, Aquarius could appeal to commercial users in the banking and finance fields, while the vector facility setup could handle scientific applications. "It could very well be positioned as a 3090 alternative," said Terry Shannon, director of the DEC Advisory Service arm of Framingham, Mass.-based International Data Corp.

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OS/2 for 386 will not be out this year

BY PATRICK WAURZYNAK
OF BIRMINGHAM

REDMOND, Wash. — An upgrade of OS/2 with Presentation Manager specifically designed for the Intel Corp. 80386 microprocessor will not ship to end users until sometime in 1990, Microsoft Corp. confirmed last week.

At the company's third annual systems software forum, Microsoft said it plans to ship 386 OS/2 tool kits to its developers later this year, with delivery of an end-user, 386-specific OS/2 version scheduled for an undetermined date next year.

In the meantime, Microsoft demonstrated an early version of its Windows 3.0 operating environment, currently being developed by the personal computer software market leader.

Over the barrier

The demonstration, which was called Windows Version 3.0 Debug Release 1.14, showed the program's ability to load several applications into memory above the 640K-byte DOS memory limit. The company loaded a large Microsoft Excel spreadsheet, Microsoft Write, Aldus Corp. Pagemaker and a Pagemaker

application and still had 836K bytes of memory free under the new Windows version.

While Windows 3.0 appeared to operate in protected mode, which allows up to 16M bytes of addressable memory, Microsoft's Vice-President of Systems Software Steve Ballmer dismissed any potential adverse impact that such a Windows release could have on the firm's OS/2 Presentation Manager version, which can also run applications above the 640K-byte barrier.

Thomas Galvin, an analyst at Smith Barney, Harris Upham & Co. in New

York, said that Windows 3.0 should have little timetable effect on OS/2's release. He noted that Windows 3.0 still lacks the multitasking and interprocess communications capabilities of OS/2.

"I see it more as a way to show users what they could do with the 386," Galvin said. Windows 3.0, he added, "gives them some momentum to their whole push for Presentation Manager and for their technology."

Although Ballmer would not be more specific on the company's timetable for delivery of the 386 OS/2 Presentation Manager beta kits and end-user 386 OS/2 products, he and other Microsoft executives nevertheless remained upbeat about the outlook for OS/2 Presentation Manager applications development.

FTS-2000

CONTINUED FROM PAGE 1

being awarded, according to James F. Kerrigan, a federal market analyst at Inpet, Inc. in Vienna, Va., and other sources.

GSA officials said the action is necessary because of legislation enacted last year by the U.S. Congress, which sought to curb defections from FTS-2000 by making it mandatory for federal agencies to use the new intercity network.

"They're just implementing the wishes of Congress... but it's a very aggressive implementation," said Eben G. Townes, a procurement analyst at the market research firm D.C. Washington, Inc. in Vienna, Va. For example, the GSA turned down five of six network procurements planned by the U.S. Department of Commerce. Reed Phillips, director of information resources management, said that only a network for the 1990 census was given exemption.

Some federal managers such as Philip K. and Martin Wagner, director of telecommunications management at the Department of the Treasury, supported the GSA action as a logical implementation of the law, but others opposed it. One network manager, who requested anonymity, said he is worried that FTS-2000 data services may not be available soon enough to meet user requirements at his agency.

Specifically, GSA's new policy includes the following orders:

- Agencies are required to use FTS-2000 for all voice, data and video services that the FTS-2000 contractors provide, unless the GSA grants an exemption.
- Agency networks must incorporate FTS-2000 services as they become available.
- When existing contracts expire, agencies must convert to FTS-2000 and must not exercise renewal or extension options. Also, exemptions previously approved for the Department of Defense are withdrawn and will be reviewed.
- The GSA will help agencies develop plans for switching to FTS-2000.

The GSA also signaled its aggressive approach by announcing it will monitor 70 to 100 agency computer procurements to help steer them away from bid protests that plague many procurements.

Numerous procurement scandals and pressure from Congress are driving the GSA toward a stronger oversight role, analysts and federal managers observed. "GSA is being pushed as far as they can go, so they're going to toughen up a little bit," Kerrigan said.

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Anatomy of a strategic alliance

Bowlett-Packard and 3Com said the first wave of products from their strategic alliance will be delivered in the second quarter and sold by both companies. The duo outlined the following terms of joint product development, cooperation and marketing:

- Partnering the basis of HP 3+Open LAN Manager with 3Com's 3+Open network software, which is based on Microsoft's OS/2 LAN Manager.
- Eventually linking HP's OS/2 offering to its 3000 and 9000 minicomputers.
- Ensuring 3+Open will work with LAN Manager/X, a Unix port of LAN Manager co-developed by Microsoft and HP.
- Co-development of a common TCP/IP for their LAN Manager-based products and a variety of network services and

multivendor connectivity products.

• Network management products operating under HP's Openview architecture.

• CCITT X.400-based electronic mail to enable HP and 3Com E-mail users to exchange messages with each other and other E-mail systems that support X.400.

• Incorporation of features from HP's New Wave user interface product into future releases of 3Com products.

Currently, 3+Open supports MS-DOS, OS/2 and Apple Computer, Inc. systems. HP supports Unix as well as its HP/UX proprietary system. The idea is to give users in both environments access to applications and systems running under all of these environments.

PATRICIA KREEPE

HP buys

CONTINUED FROM PAGE 1

next two to three quarters," said Frank Dinsbeck, a network consultant and president of Network Communications Architects.

In addition to the service, a 3Com spokeswoman said that the vendor's top priority was porting 3Com's 3+Open network software, which is based on Microsoft Corp.'s OS/2 LAN Manager, to Unix. This would enable 3+Open, which will be resold by HP, to talk to HP's Unix port of LAN Manager, LAN Manager/X (LM/X). LM/X will reportedly ship in the fourth quarter.

Under a nonexclusive agreement, HP said it will provide worldwide support for 3Com systems, including its Bridge Communications, Inc.-labeled products. Customers of both vendors can now purchase support services for HP and 3Com equipment under one contract.

"I have much more confidence in HP support," said an HP and 3Com user at a large paper products company in the Northwest who currently has his 3Com networks serviced through an agreement with an independent contractor. He said he is inclined to hand over all his 3Com service needs to HP, gaining the ability to maintain one service contract as a positive move.

FOR 3COM TO develop the support infrastructure it needs to compete with DEC and IBM in corporate accounts is an awesome task.

STEVEN SPANIER
INFONETICS

With more MIS directors taking charge of local-area network purchasing [CW, Feb. 20], LAN vendors are moving quickly to rid themselves of a reliance on reseller-provided services. 3Com rival Novell, Inc. also unwrapped arrangements last week with four service providers, including HP.

"Service and support will more and more become the differentiating factor. For 3Com to develop the support infrastructure it needs to compete with DEC and IBM in corporate accounts is an awesome task," said Steven Spanier, an analyst at Infonetics, Inc., a market research firm in Santa Clara, Calif. On the other hand, HP's service is rated very highly in the kinds of accounts that 3Com wants to cultivate, he added.

The scalable server concept ties in well with the desire of minicomputer vendors to both fend off the encroachment of high-end workstations and tie their Unix systems into MS-DOS-based LANs.

"I'd really like to see HP main servers," said David Mathews, manager of the computer center at the Business School of the University of Southern California at Los Angeles.

3Com Chairman William Krause said the partnership will also result in a broad range of distributed computing products based on industry standards, with a clear emphasis on Transmission Control Protocol/Internet Protocol and CCITT X.400.

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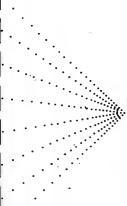
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Vying for attention on the plant floor

IBM WATCH

TONY FRISCA



Although IBM is No. 1 in providing key manufacturing technologies such as production control and computer-aided design and manufacturing (CAD/CAM), it lags behind competitors DEC and Hewlett-Packard as the vendor of choice for the primary plant computing platform.

Unaccustomed to finding itself in the runner-up position, IBM is using its full resources to capture users' attention on the plant floor. The firm recently introduced the plant-floor series Distributed Automation Edition (DAE), which offers a scalable product line that allows users to run tasks cooperatively on a number of different nodes. Within this framework, IBM is positioning the 9370 as a small plant host or area computer. Support for cells and plant devices is through the personal computer family — the core of the IBM plant-floor strategy.

Along with the introduction of DAE, IBM is making a number of moves to intensify its push to improve its market standing. Two themes are emerging from this thrust: IBM is leveraging its own investment in factory automation to yield internal and external product-development benefits, and the company is getting the message out about the payoffs of computer-integrated manufacturing (CIM) through marketing programs and donating equipment to universities.

These activities contribute significantly to the development and acceptance of DAE. The DAE strategy stems from IBM's internal investment in manufacturing automation. Unlike most manufacturers, IBM can devote extensive resources to turning internally developed manufacturing technology into a commercial business. To support this opportunity, however, the company needs to establish credibility as a plant-floor vendor. The university program and customer education programs are longer term strategies to seed market acceptance.

Learning CIM lessons

Without the experience of automating itself, IBM could not have realized the features that a CIM platform requires. In the past few years, much has been written about the unrealized promise of CIM. Studies show that the problem with making an investment in factory automation is that each plant or process is unique and therefore requires a custom solution.

Until recently, vendors have not offered users the tools to minimize the custom content of major CIM projects. This problem limits the prospects for rapid CIM market development. A user who wants to fully automate is forced to either go into the computer business or to take on the massive job of building piece-meal solutions on multiple platforms. Neither alternative is acceptable.

IBM is well placed to take on the expense of building such platforms because the costs of developing these tools for in-

ternal use can be offset by "productizing" for users. In addition, such facilities are usually turned into marketing showpieces.

A question still arises: IBM has little traditional standing on the plant floor — in fact, it is negatively regarded by the plant-floor user culture, which is more accustomed to other vendors and noncomputer control. How does it overcome this obstacle?

Proactive approach

Answering the challenge, IBM quietly rolled out CIM and plant-floor products to its direct sales force, users and third-party

distributors. The company set up a CIM National Support Center in Boca Raton, Fla., for training and support. It installed 14 regional hands-on demonstration centers and 44 midleveling centers. IBM provided an extensive road show that attracted more than 1,700 users and sales representatives in 17 cities.

This marketing effort includes a special "CIM in Universities" campaign. To date, IBM is working with almost 50 colleges and technical schools as part of its Academic Computing Information Systems (ACIS) program. This CIM program will cost IBM approximately \$25 million,

not including promised technical and consulting support.

This ACIS program is especially important in seeding IBM's future in the plant-floor market. IBM established a similar program in the engineering market several years ago at the height of its aggressive move into CAD/CAM, and IBM has since firmed its position as the market leader in that field.

This university program is strategically linked to IBM's future growth in the factory. It is also a confirmation that IBM's commitment to this business is long term, since the investment will take several years to pay off. If the program works, however, the company could go from parish to preferred vendor in the plant-floor computing market.

"Computerworld Response Card Decks really opened doors to the 'heavy-hitter' accounts..."

Spectrum Concepts, Inc. is a 10-year-old software developer based in New York City. The company, which provides software and services to large corporations and financial institutions, recently developed XCOM 6.2, an LU6.2-based software product that dramatically improves file transfer between different computing environments.

XCOM 6.2 eliminates the need for extensive custom programming when transferring data from one computer to another, including PCs, mainframes and minis. And it significantly lessens the amount of time necessary to complete connectivity projects.

Company president Alec Gindis was impressed with industry reaction after a news story announcing XCOM 6.2 appeared in *Computerworld*. So when Spectrum began implementing its marketing strategy for the new product, he considered *Computerworld* a key resource.



— Alec Gindis
President
Spectrum Concepts, Inc.

"Our goal was to generate sales leads from major organizations — Fortune 500 and Fortune 1000-type companies — that need to transfer files. We decided to use response card decks, and, based on the reaction we got to that product announcement, *Computerworld*'s was the card deck we thought of first.

"And it's paid off; the results have been terrific. We've received hundreds of high-quality leads so far, and they're still coming in. In fact, *Computerworld* Response Card Decks really opened doors to the 'heavy-hitter' accounts — major organizations that learned about us through the cards.

"Now we've gotten to where we are recruiting additional account executives to follow up on the volume of these leads. *Computerworld* Response Card Decks give us the best cost per lead of any medium. They also let us refine our marketing strategies through scientific 'split testing' — something other card decks don't always offer. We consider that a valuable bonus."

Computerworld Response Card Decks give you a cost-effective way to reach a powerful buying audience of over 127,000 computer professionals. They're working for Spectrum Concepts, Inc. — and they can work for you. Call Norma Lombardino, Accounts Manager, *Computerworld* Response Card Decks, at (201) 967-1350 to reserve your deck today.

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Company	Switch	Access	Carrier	Status	Notes
Adco, Hartford, Conn.	AT&T 5ESS	Isdn	Southern New England Telephone	Installation underway	
Amesbury Systems, Phoenix, Ariz.	AT&T System 48 PMS/MSB	Primary	AT&T	Started July 1988	First customer of AT&T's Primary Path.
Amesbury Telephony, Indianapolis, Ind.	AT&T System 48 PMS/MSB	Primary	AT&T	Started Dec. 1987	Does not use for AT&T's Primary Path.
Anderson, State of, Phoenix	Northern Telecom DMS-100	Isdn	US West Communications	Started Mar. 1988, already ended	
Bentley Co., Seattle	AT&T 5ESS	Isdn	US West Communications	Scheduled start Nov. 1988	
Convergys Software International, Pittsburgh	AT&T 5ESS	Isdn		Contract pending	
Coastal Corp., Atlanta	AT&T 5ESS	Isdn	Southern Bell	Started April 1988	Paying customer.
Coastal Data Corp., Minneapolis	SEC MARK ONE	Isdn	US West Communications	Started Mar. 1987, ended Mar. 1988	
Data Publishing, Boston, N.C.	AT&T 5ESS	Isdn	Southern Bell		
Decision Support Co., Princeton, N.J.	Northern Telecom DMS-100 PBXs	Primary		Started Aug. 1988	First Primary Path using DMS-100s.
Federal National Mortgage Assoc., Washington	AT&T 5ESS	Isdn	CSP Telephone	Started June 1988	
Glenn Inc., Research Triangle Park, N.C.	SL-1 PBX and DMS-100	Primary/Isdn	GTE South	Started June 1988	First Primary Path/Isdn Path in one bid.
Harbison, Oakley Street, N.C.	Northern Telecom DMS-100	Isdn	Carolina Telephone	Scheduled start Jan. 1989	
Hayes Microcomputer Products Inc., Fremont, Cal.	AT&T 5ESS	Isdn	Southern Bell	Started April 1988	Using ISDN to develop ISDN products.
Healing Hands Corp., Hershey, Pa.	AT&T 5ESS	Isdn	Pacific Bell	Began 1987 to Sept. 1988	
Intergraph Products Corp., Huntsville, Ala.	AT&T 5ESS	Isdn	United of Pennsylvania	Scheduled start Oct. 1988	Will include ISDN satellite workstation.
Intergraph Information Systems, Huntsville, Ala.	Northern Telecom DMS-100	Isdn	US West Communications	Started Jan. 87, already ended	Applications included corporate information systems office and engineering at home.
Johns Hopkins Medical Center, Baltimore	AT&T 5ESS	Isdn	CSP of Maryland	Contract pending	
Lanterns University Laboratory (University of California), Livermore, Calif.	AT&T 5ESS	Isdn	AT&T Federal Systems		
Leithead Studios and Space Co. Inc., Springfield, Calif.	AT&T 5ESS	Isdn	Pacific Bell	Started Sept. 1987, ended Sept. 1988	Test.
Mass. Institute of Tech., Cambridge	AT&T 5ESS	Isdn		Scheduled rollout Oct. 1988	Using AT&T 5ESS as PBX to include network.
Medstar All-Power Team, Evansville, Ind.	AT&T 5ESS	Isdn	AT&T Federal Systems	Started Aug. 1988	Order for ISDN equipment at \$2.50/line.
Midwest Straight Corp., St. Louis		Primary	AT&T	Unannounced	
Minuteman Inc., Spencer, Mass.		Isdn	New England Telephone	Installation underway	Part of contract contract.
Northern Inc., Schaumburg, Ill.	Northern Telecom DMS-100	Isdn	Western Bell	Planning stage	
OMMA, Washington	AT&T 5ESS	Isdn	AT&T Federal Systems		
Orco Corp., Ogden, Utah	Northern Telecom DMS-100	Primary			Telemarketing company using private ISDN.
Paradigm Systems, Portland, O.	Northern Telecom DMS-100	Primary			
Perceptics, Dept. of, Huntsville	Northern Telecom DMS-100	Isdn	Bell of Pennsylvania	Contract pending	Plans to use 144 Kb/s and Modems, O.
Phil & Whiting, Phil, Hartford, Conn.	AT&T 5ESS	Isdn	NET		Develops network with ISDN in Huntsville.
Phaser Computer Inc., Rind, Mass.	AT&T 5ESS	Isdn	Southern Bell	Started April 1988	Paying customer.
Radwell Communications Systems, Indianapolis, Texas	AT&T 5ESS with two access	Isdn	Southwestern Bell	Scheduled start Dec. 1988	40 buildings in a campus environment will be linked via ISDN.
Shell Oil Co., Houston	AT&T 5ESS	Isdn	Southwestern Bell	Start Sept. 1988	Plan to use 144 Kb/s ISDN line.
Shelton International, Indianapolis, Ind.	Business DMSB	Isdn	Southwestern Bell	Started Feb. 1988	
Shelton Services Corp., Atlanta	AT&T 5ESS	Isdn	Southern Bell	Started April 1988	Paying customer.
SRI Corp., St. Paul, Minn.	AT&T 5ESS	Isdn	Southwestern Bell	Started Aug. 1988	Plan to use 144 Kb/s ISDN line.
Tenneco Inc., Houston	AT&T 5ESS	Isdn	Southwestern Bell	Started June 1988	Plan to use 144 Kb/s ISDN line.
University of Arizona, Tucson	AT&T 5ESS	Isdn	US West Information Systems Inc.	Planning stage	Using AT&T 5ESS as PBX for remote access.
University of Connecticut, Storrs	AT&T 5ESS	Isdn	NET		
University of Illinois, Champaign	Northern Telecom DMS-100	Isdn	Indiana Bell		
University of Maryland, College Park				Unannounced	
University of South Florida, Tampa	AT&T 5ESS	Isdn	GTE South	Started Oct. 1987	
U.S. State of Oregon, Portland	Northern Telecom DMS-100	Isdn	US West Communications	Started March 1987	Test.
Virginia, State of, Richmond	AT&T 5ESS	Isdn	CSP of Virginia	Started April 1988	
West Virginia University, Morgantown	AT&T 5ESS	Isdn	CSP of West Virginia	Scheduled start Dec. 1988	Plan to use 144 Kb/s line.

Note: This chart was compiled by CommunicationsWeek with information provided by Telecommunications Inc., Saltwater, N.J., as well as from news releases and published reports. Carriers, switch manufacturers and their affiliated companies are not listed.

The ISDN Scorecard.

As the demand for ISDN grows, so does the number of ISDN suppliers eager to take credit.

But, as you can see by this CommunicationsWeek chart, there is one clear-cut ISDN leader—the company that helped build the standards for ISDN. That company is AT&T.

95% of ISDN lines are on an AT&T 5ESS® switch.

AT&T Network Systems has helped more local telephone companies install more ISDN lines than any other telecommunications supplier—95% of non-trial ISDN lines. What's more, we've already shipped over 200,000 ISDN lines for future use. Today, 99 central offices can offer operational ISDN services over the AT&T 5ESS switch, with a total of 415 upgraded with ISDN software.

So, while other suppliers are still in product development trials, AT&T Network Systems is helping phone companies across the nation offer ISDN services right now on today's network. Services such as simultaneous voice and data transmission, high-speed facsimile and electronic mail all over a single phone line.

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We believe that ISDN is the beginning of a bigger future. A future we call Universal Information Services. A future where networks can carry voice, data and image into anyone's office or home at any time in any combination, with maximum convenience and economy.

At AT&T Network Systems, this belief is already driving our technology, our product development and our commitment to you.



The right choice.

EDITORIAL

The real target

THE NEWS THAT an 18-year-old Chicago hacker will spend nine months in prison without the possibility of parole (CW, Feb. 23) is encouraging to those who advocate a hard line against computer crime. But the conviction and sentencing of Herbert Zinn Jr. under the Computer Fraud and Abuse Act of 1986 also raises a disturbing set of questions about who will be prosecuted under that and other statutes.

On the one hand, it appears that Zinn got what he deserved for purloining more than \$1 million worth of software, destroying files and publishing information on how to crack AT&T's computer security system. His sentence should put a damper on the type of computer bulletin-board chatter that advocates this kind of flagrant disregard for property and privacy. It also sends a message to would-be hackers that breaking into corporate computers is as bad as breaking into corporate offices — and will be dealt with just as sternly.

But the conviction of the "Shadow Hawk" raises new questions about whom the hacker laws protect and whom they convict. Hackers like Zinn are a relatively easy target. They are usually kids operating out of their homes who have little understanding of the organizations they are penetrating. They prowling around until they hit on something juicy, then after a file or leave a message. Their agenda is to hack for the sake of hacking; any havoc they wreak along the way is incidental.

The more devious and far more dangerous computer criminal is the corporate insider. This hacker usually knows just what he wants to do and how to do it. He works quietly and quickly, deleting or altering batches of files and covering his tracks as he retreats. He is devastating and elusive.

Corporations have an annoyingly schizophrenic attitude toward these two breeds of intruders. They willingly make an example of the amateur hacker but cover up the damage wrought by the pro. Fearful of negative publicity, embarrassed by their own vulnerability, they fire the guilty employee and swallow losses that may run into the millions rather than expose their weaknesses in court.

This brings up an interesting question. Who will be the target of new antihacker legislation? Using it to prosecute loners like Zinn or alleged Internet hacker Robert Morris Jr. may scare off the small-time crooks, but the big offenders will still get away with a kick out the door. This situation will continue until a major bank or insurance company is ready to step out of the shadows, lay bare its mistakes and throw the book at one of its own.

We have long supported legislation to treat computer crime the same as any other crime against property or privacy. Federal and state authorities and the courts are now showing a willingness to do their part to prosecute and sentence violators. We hope the victims won't remain silent.



LETTERS TO THE EDITOR

Clear as Bell

Regarding the article on Bell Atlantic's Lanserver Plus local-area network server (CW, Nov. 7), David Terrie, president of Newport Consulting, appears to misunderstand our product.

Lanserver Plus software integrates Bell Atlantic's Langate central office-based LANs with higher speed, premises-based Ethernet LANs and, early next year, with Token-Ring LANs. Also, Bell Atlantic provides customers with a full range of services, including financing, leasing, installation, maintenance and custom-solution design.

Terrie's comments regarding PC servers and software fail to recognize that they are targeted at very different markets than the Bell Atlantic product. Our product was designed especially for Langate networks, connecting users who may be miles apart; Novell, Inc.'s Network and 3Com Corp.'s product cannot run on Langate.

Finally, Lanserver Plus support for Token-Ring LANs will not be available until Release 2, which will integrate the pre-existing Langate and Lanserver Plus network management features.

W. David Douglas III
Assistant Vice-President
Product Line Management
Business Services
Bell Atlantic
Arlington, Va.

Too big fermi

While Charles Lecht's article (CW, Jan. 16) is in part out of this world, he should spend more time reviewing earthly dimensions: His definition of a fermi is

1,000 times too big. It is actually one quadrillionth of a meter.

Anthony Whitman
Chief Engineer
System Development Corp.
of Japan
Tokyo

Real forces

Your editorial, "Going down" (CW, Jan. 23), prompts legitimate concern for the pricing strategies and profit motives of PC vendors. However, I take issue with your accusation that vendors cloak their actions in the "guise" of market forces when, in fact, there are legitimate

forces to contend with.

With inventory levels for computer hardware at an all-time high, vendors are basically selling equipment that was manufactured when dynamic random-access memory (DRAM) prices were at their highest.

Also, it takes 30 to 45 days to assemble components, manufacture a product and then package it. So, even in a best-case scenario, it might take a vendor about two months to bring a project to market that reflects the lower priced DRAMs.

Nonetheless, if you really want to strike a blow at greed, why not blow the whistle on the DRAM vendors? Both American and Japanese firms played a key role in bringing about a poorly conceived trade agreement that did not fully take into account the dynamics of the marketplace.

Indeed, the trade agreement let DRAM vendors take advantage of market conditions to raise prices and reap exorbitant profits at the expense of consumers and system integrators.

As a board and subsystem manufacturer whose lifetime is very much dependent upon the availability and pricing of DRAMs, I urge the Bush administration to overhaul the trade agreement so that, in the spirit of competition, consumers get a fair shake.

Cliff Wilder
President
Microtech International
Branford, Conn.

This week in history

Feb. 26, 1979

Two employees of Electronic Data Systems Corp. (EDS) held hostage by the Iranian government are freed in a commando-style raid organized and financed by EDS Chairman H. Ross Perot and led by U.S. Army Green Beret Col. Arthur (Bud) Simons. Iran had seized the EDS employees to force the firm to return to the Middle East.

Feb. 27, 1984

IBM replaces its 3080 series of mainframes with the 3083, 3081 and 3084 models, whose design and circuit-packaging changes reportedly boost internal performance 5% to 14% over current models. Current 3080 series users cannot field-upgrade to the new machines, however.

Computersworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Lohrman, Editor, Computersworld, P.O. Box 9177, 375 Commonwealth Road, Framingham, Mass. 01701.

Why not make it right the first time around?

EFREM G. MALLACH



Funny how people get more credit for finding a problem than for avoiding it in the first place.

Any fool can drive a car to miss a telephone pole. Making a car drivable again after it hits that pole at 40 miles per hour takes talent.

We rectify the same way in the computer business, and vendors know this. It is amazing how often they create a problem and then fix it with fanfare rather than avoiding it in the first place. It is even more amazing how we thank them for this service rather than asking why the problems arose in the first place.

Here are a few examples of vendors featuring the fix:

Datapoint. Many years ago, this company offered only small, slow, eight-bit processors. All of its competitors had bigger and faster 16-bit minis.

Datapoint's engineers apparently were not very good at designing fast CPUs. So they put several small systems on a wire and invented Arcnet, the world's first local-area network.

The marketing folks pushed modular expansion, file servers and other 1989 hot products—back in the mid-70s. They did quite nicely with the concept for a while. Their salespeople never talked about why Datapoint chose this approach. And customers never questioned it.

DEC. Every article on artificial intelligence mentions Xcon, one of the first successful industrial systems. In the days of the VAX 11/780, there were reportedly only five or six engineers with DEC who could install a tentatively get VAX configurations right. So Xcon was developed to check VAX configurations for validity.

The question nobody asked was why could even other mini-computer vendor design systems of the same performance level and configuration flexibility in such a way that the ordinary mortals on their staffs could configure them?

IBM. Systems Application Architecture (SAA) is intended to provide common interfaces to several inherently incompatible systems. IBM is fixing a problem and should get credit for doing so.

But let us not forget that the problem is one of IBM's own making. It resulted from IBM management's never having

forced products of different families to work alike. While SAA's benefits—should they ever arrive—will improve the existing state of affairs, it would have been better for users if IBM had managed its product lines to provide user-level compatibility among disparate architectures earlier and with no noise.

The word "architecture," by the way, should be a red flag. Hearing it usually means that one is about to endure a massive dose of "If you can't fix it, feature it." Lengthy presentations of grandiose architectural schemes are a standard cover-up for lack of real products.

IBM. (It's a big enough to get two mentions.) Systems 36 users who upgraded to the B10 or B30 models of the Application System/400 with the mini-AM 4M bytes of memory found themselves with far less performance than they had before. IBM did the right thing: It offered these users another 4M bytes free for a year and set up support mechanisms to speed their conversion to the lower overhead native AS/400 model.

Yet amid the praise being heaped on IBM for taking these steps, we tend to forget one thing: The praise is for dealing with a situation that proper testing would have caught and that IBM never should have permitted to exist in the first place.

Problems are not going to go away. Computer systems and their applications grow more complex daily. Perfection, an admirable goal, is not always attainable. The way in which it remains to the challenge of dealing with its self-inflicted wounds is a good test of that firm's character.

However, when a vendor takes a problem-solving product or service as a boon to its customers, those users owe it to their management and stockholders to ask the following hard questions:

- Precisely what, dear vendor, is the problem you are solving?
- Was this problem of my doing—or one that you created yourself?
- Should this problem exist in the first place? Do your competitors have it? If not, why not?
- Why couldn't you avoid the problem? What steps have you taken to keep the same thing from happening again?
- If it does happen again, how do I know you'll be just as eager to fix it next time? And will you put that in writing?

It is up to users to keep vendors on their toes. To do this job properly, users must examine the emperor carefully—and screen loudly if he's naked.

Benchmarking Brainiac 1000

Artificial intelligence has a tough time just getting past the worm level

HARVEY P. NEWQUIST III



You may have heard a lot of talk this past year about neural networks, parallel processors, multi-processors and other commercial and academic attempts to build computers on a scale closer to the human brain. But one thing you may not have heard much

about is what this effort actually means or what the new technologies are really accomplishing.

A friend at a neural network company told me that in terms of "biomimetic" evolution, today's products can compete head-to-head with a level of intelligence on par with a worm.

Only a worm, you ask? Yes, a worm. Attempting the feats of the human brain would require, well, a human brain.

Let's take a look at the brain as if it were an actual production computer—the Brainiac 1000—and see what it can do. Specifically, consider the brain of

an entertainer, say a singer such as Frank Sinatra, Sting or Bruce Springsteen.

Such a line of work is certainly not thought-intensive like nuclear physics or quantum mechanics; thus, it qualifies as a fairly normal activity that requires a "regular" amount of brain work. Here is our starting point for the brain/machine performance benchmarks.

Let's say each of these singers has recorded more than 100 songs in various formats, including studio versions, live versions, radio broadcasts, promotional pieces, cover versions and so on. Each of the performers is equipped with a standard Brainiac 1000, which comes complete with audio signal recognition for accessing information using signals as inputs.

We will base performance on the "Bob Barker Benchmarks," actually known as the "Name That Tune" measurement scale. In our test, we play an excerpt from a song for four seconds, long enough for our singer to

recognize one of his own tunes.

Using full stereo reproduction of a particular song, it is quite possible that each second of information could contain 64,000 bytes of data (you can verify this number by observing how much space a musical sample takes up on a hard disk).

Four seconds multiplied by 64,000 bytes equals 256,000 bytes. Since the Brainiac is outfitted with two ears as input devices, the total number of bytes



in the incoming signal is doubled to 512,000. Thus, the Brainiac is receiving about half a megabyte of information during the four seconds.

The input has to be compared with the information contained in the Brainiac's database for the tune to be correctly identified. Given that the 100 songs run about four minutes each, that means they take up about 15,360,000 bytes of storage per song (64,000 bytes multiplied by 60 seconds multiplied by 4 minutes). Thus, 100 songs take up 1,536,000,000 bytes in the Brainiac's memory, or 1,536M, 000K, bytes, or 1,536M bytes or 1.5G bytes.

In trying to find a particular song segment, half the database would have to be searched on average to achieve each match. So, 750M bytes of information must be checked in each five-second period to obtain the correct answer.

Tests show that under normal, sober working conditions, the Brainiac comes up with the right answer about nine out of 10 times.

Remember, we are dealing with organic matter that is actually accessing information by

way of electrochemical impulses. Even though such impulses are notoriously slow—about 100 feet per second—they still outperform electrical impulses over metallic conduits, which can travel about one foot per nanosecond or a billion feet per second.

The theoretical advantage in the electrical realm is about 10,000 to 1 over the electrochemical processes. Nonetheless, our Brainiac is consistently able to retrieve and correctly identify each thing more than 90% of the time. So what gives?

Scale has a lot to do with it. There are some 10 billion neurons in the brain that have an estimated 10 trillion interconnections running among them, with an average lead width of about three microns.

Brain-washing machine

One of the largest and most awe-inspiring multiprocessor computer units on the market today—the Connection Machine from Thinking Machines Corp.—has 65,536 processors with which to manipulate information and is the size of a washing machine. Media responses 150,000 times as many processors into the human skull.

Secondly, the Brainiac can deal with spatial and complex relationships not based on numbers or sequential sequences. Even the most expensively benchmarked computer is an autistic savant, much like Dustin Hoffman's character in the movie *Rain Man*. It can calculate as fast as you can get the numbers into it. But try getting it to make a rational decision with no outside help, and the whole system breaks down.

Basically, the argument boils down to one fact: No one knows exactly how the Brainiac 1000 stores information. Thus, memory retrieval as I have described, or as any neural network model attempts to describe, is only theoretical at the very best.

Why can the Brainiac remember a four-minute song from a decade ago but not remember what it had during a 40-minute broadcast one week before? The answer cannot be found in any computer, even in those attempting to mimic the Brainiac or in the billions of neurons in the Brainiac itself.

The point of this whole exercise is simply to show you how difficult it is to try to replace the human brain with a hardware or software architecture of any type. Under even the simplest of conditions, the brain is still the original model. All other models—whatever their performance benchmarks—are in fact imitations that crawl in comparison.

Mallach is a faculty member at the University of Lowell in Massachusetts and a consultant to users and vendors.

Newquist writes and consults on artificial intelligence and other advanced high-technology topics from his office in Scarsdale, Ariz.

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SYSTEMS & SOFTWARE

HARD TALK

Jean Bosman

Battle for high ground



Amdahl has good reason to feel confident this year. Revenue is up, and orders are piling in. Better yet, it has beat IBM at its own game three times over: Amdahl has a faster uniprocessor in the 5990, it has a more capable disk drive in the 6100, and it revised its UTS mainframe Unix system days before IBM said it would be late with AIX/370 shipments [CW, Feb. 20].

Amdahl has, therefore, positioned itself as the best alternative to IBM. Users, Amdahl executives say, get IBM compatibility, better price/performance and extra features such as UTS, which is able to run native on a VM/ as a host operating system.

But Amdahl executives may have reached too far in this kind of the hill game when they asserted recently that fellow plug-compatible manufacturer (PCM) National Advanced Systems (NAS) was no longer in contention. It is a charge that raises the specter of Amdahl being the only major PCM and the danger that customers will pay higher prices in an era of reduced competition.

NAS, which suffered slower sales and dropping profits last year, is in the midst of a corporate spin-off from parent National Semiconductor. Though still half-owned by National

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ESA in VM's future

Release would boost storage, speed capabilities

ANALYSIS

BY STANLEY GIBSON
CW STAFF

IBM's next major release of VM, due in approximately 18 months, will offer Enterprise Systems Architecture capabilities, according to an IBM official.

"It is definitely a direction to have VM support the ESA architecture," said Bob McNamara, manager of Enterprise Systems software introduction at IBM. IBM's most recent enhancement to VM, VM/XA SP 2, began shipping in late December.

VM users are in the midst of digesting that release and reportedly are giving little thought to the next one. However, IBM has been briefing analysts and users, setting forth its general

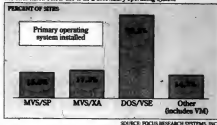
directions on a future release of VM with ESA capabilities.

MVS/ESA, announced approximately one year ago, has been available for about six months. MVS/ESA brings 16 terabytes of addressability to users and offers such performance-improving features as Data Spaces and Hiperspaces, which allow large chunks of data to reside in expanded memory, thus reducing I/O to disk and improving an application's processing speed. According to Focus Research Systems, Inc., 14.6% of IBM and plug-compatible mainframe sites plan a new operating system of some kind, of those, about one-third plan MVS/ESA.

Early MVS/ESA users report that the new operating system is significantly less difficult to install than MVS/XA. IBM would

VM in background

VM is not widely used as a primary operating system, but recently half the sites listed below use it as a secondary operating system



not release figures of ESA licenses thus far but did say there were significantly more MVS/ESA licenses in the first six months of the operating system's life than there were during the first six months of MVS/XA's availability.

IBM recently announced DF

Series 300, a software program that keeps data to be sorted in Hiperspace rather than on disk. The program is batch-oriented.

VM, on the other hand, is oriented toward interactive use. McNamara said, however, that VM could make use of ESA functionality as well by allowing applications with very large memories

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Pharmacy net software checks insurance claims

BY AMY CORTESE
CW STAFF

The age of on-line verification is coming to retail drugstores and pharmacies. Soon these outlets will verify insurance claims just as retail stores authorize credit purchases.

Engaged in a joint effort, Stratut Computer, Inc. in Marlboro, Mass., and Dallas-based Shared Financial Systems, Inc. hope their recently announced Healthnet/2 system can be the remedy that pharmacies need.

With health insurance increasingly covering prescriptions, drugstores are taking more risks by honoring insur-

ance claims without being able to verify them on the spot. If a claim is rejected by a carrier for any reason, the pharmacy does not get reimbursed for the prescription.

Retail drugstores typically have no way of checking the validity of insurance eligibility. Additionally, the federal government has mandated on-line authorization of Medicare claims by 1991.

With Healthnet/2, according to the vendors, a patient's health insurance coverage can be checked on-line. The patient's insurance number is entered into the system, either by key entry

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Sequoia hikes system power but not prices

BY ROSEMARY HAMILTON
CW STAFF

MARLBORO, Mass. — Sequoia Systems, Inc. plans to announce the next generation of its fault-tolerant computers today with promises of faster processors at current prices.

The Series 300 will be based on the Motorola, Inc. 68030 microprocessor and will be offered for approximately the same price as the current product line, the Series 200, according to Keith Johnson, Sequoia's vice-president of marketing.

The company will continue to

sell the Series 200, which was introduced in October 1987, even though the Series 300 has a faster processor and a similar price, Johnson said.

For example, a customer may want to add another Series 200 processor to its existing system, he added.

A typical four-processor Series 300 configuration, which supports up to 300 users, will sell for \$653,000, Johnson said. The system can be expanded to a 64-processor configuration.

An entry-level system with

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inside

- In step with liquor firm's system installation. Page 25.
- CDC adds three to Cyber 110 line. Page 25.
- HP's RISC-based architecture a hit in Europe. Page 25.

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SOFT
TALK

Stanley Gibson

Benchmark
black magic

Is it real or is it benchmarking? Why is benchmarking such a joke? One reason is that vendors

usually assign the task to their marketing department. A marketing department will approach benchmarking not as the pursuit of truth but as an adjunct to sales.

Typically, any salesperson will marshal numerous facts to promote his product, frequently omitting inconvenient bits of information. The buyer must stay informed to know the right questions to ask and look for the facts that get left out.

Benchmarking works much the same way. The goal is always to construct a test that exaggerates a given product's strengths and minimizes its weaknesses.

Over the summer, DEC internally audited its systems running its DEC TP software. Whatever the results of that test were, we have yet to see them. Why? It stands to reason that if the results were good, then the whole world would have heard about them by now. Instead, some six months after those audits, Peter Marwick is retesting the DEC systems, at a time when some of the hardware has been superseded and more is about to be.

Too often, the auditor is put in the position of watching what

Continued on page 28

A distribution system for spirits

When importer needed a change, custom 9370 package was low-cost route

ON SITE

BY ROBERT MORAN
OF STAFF

FORT LEE, N.J. — When The Paddington Corp. boosted up its IBM 9370 Model 60 last month, it was the last step in the spirits and wine distributor's search for distribution and financial software and a low-overhead synergy with its parent company's affinity for the IBM 370.

Paddington, whose primary brands are J&B Whisky, Baileys and Amaretto di Saronno, is a division of Grandmet Consumer Products, Inc. The rapidly expanding company had outgrown its old system, which was based on a Microdata Corp. minicomputer and a few IBM Personal Computers. The company wanted a new system but wished to avoid the systems programming overhead that developing new systems would entail.

Today, the 9370 Model 60 supports 21 terminals in headquarters and five regional offices

throughout the U.S. It runs everything from accounting to inventory control. In addition, 70 IBM PCs and ATs link the field sales force in regional offices to



Paddington's Gragg

headquarters via modems.

However, when Paddington started out, it could not find a distribution control or financial systems that matched the peculiarities of operating in the liquor industry.

Paddington imports spirits

and wines that go directly from suppliers to wholesalers, sometimes from several companies to several locations in the U.S. In addition, some states control the liquor, and they warehouse the products at Paddington's expense. Since those states monitor shipments to liquor stores and drew upon a warehouse, Paddington bills the state.

"Most distribution packages assume that products are imported and then simply distributed," said Keith Gragg, Paddington's director of planning and development. "But all of our distribution paths must interconnect." After a long search, Gragg chose to leave his software customized. Although financial software was available under IBM's VM/IS, tying it with Paddington's distribution software would have required customization anyway, Gragg said.

Paddington chose the 9370 Model 60 because "the VM/IS operating system is easy to use

Continued on page 27

CDC joins
graphics
paradeBY JAMES DALY
OF STAFF

MINNEAPOLIS — Control Data Corp. became the latest firm to upgrade in the increasingly competitive high-powered graphics workstation market with the recent rollout of a trio of additions to its Cyber 910 line.

The three-model Cyber 910-600 series uses the power of the Mips Computer Systems, Inc. reduced instruction set computing (RISC) microprocessor to prevent CDC's high-end line from being left in the dust by its workstation competitors.

Firms such as IBM, Digital Equipment Corp., Silicon Graphics, Inc. and Prime Computer, Inc. offer similar price/performance machines and either sell Silicon Graphics workstations or the Mips RISC board on which the Silicon Graphics machine is

Continued on page 26

European users say moving
to HP RISC series a breezeBY JANE LAWRENCE
OF STAFF

LONDON — Upgrading to Hewlett-Packard Co.'s Precision Architecture is like moving from a Model T Ford to a sleek 1989 model, data processing manager Malcolm Kilby says.

"We expected a leap forward in performance, and we got it," he said, noting that the only downside was trading in his HP

3000 Series 33 for a fraction of its original cost.

Kilby's firm, Melrose Bacon in North Yorkshire, England, is just one of many European customers that have made the move from traditional HP machines to the firm's reduced instruction set computing (RISC)-based Precision Architecture.

HP would not give detailed figures but said hundreds have

Continued on page 26

Data View

Minority automate load management

A survey of U.S. utilities revealed that more than half haven't automated load management functions and have no plans to do so.

PERCENT OF RESPONDENTS (BASE OF 362)

Plan to automate over next few years

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European users

CONTINUED FROM PAGE 25

been sold in the UK, thousands in Europe and many thousands worldwide.

The company now sells two Precision Architecture families — the HP 3000 Series 900, which runs the proprietary MPE operating system, and the HP 9000 Series 800, which runs Unix. In addition, HP still sells two of its traditional architecture systems — the HP 3000 Model 70 with MPE and the Unix-based HP 9000 Model 300 workstation.

The decision to run both Unix and MPE on Precision Architecture machines may be paying off despite past problems. Initially, the MPE-based systems were

delayed while HP ironed out the difficulties of running a proprietary operating system on a RISC machine.

But the effort was considered worthwhile. Existing customers can upgrade to Precision Architecture while preserving their investment in software applications either by running them in emulation mode or recompiling to run native.

There are also no problems with conversion, Kilby said. "HP did its homework, and you have to give credit for compatibility. There are hardly any problems with regard to software," he said.

London-based entertainment group Mecca Leisure was a beta-test site and moved from a Model 70 running MPE to a Model 950 running MPE XL.

Systems manager James Cohen went

to HP's migration center for upgrade help, first recompiling MPE to run under the native mode of the 950. Most of the code transferred easily, although some needed updating, Cohen said, who warned that the changes must be made before the software is moved to the new system.

Once converted, his system ran between five and eight times faster. Now, Mecca is installing a Unix-based Precision Architecture machine to run a specialized hotel package.

A computer systems manager at a UK stationery company who did not wish to be named was even more cautious in his approach to conversion. When he moved from an HP 3000 Model 52 to a 950 in 1986, he kept both systems running in tandem for two months.

CDC joins

CONTINUED FROM PAGE 25

based. CDC's workstations are made by Silicon Graphics, in which CDC has a 20% interest.

CDC officials said the Cyber 910-612, 910-622 and 910-624 are based on a design featuring tightly coupled, symmetric multiprocessors with shared memory and offer up to five times the processing power of CDC's other workstation models.

The 910-612 offers two 16.7-MHz RISC processors and two floating-point coprocessors, while the 910-622 has a pair of 25-MHz RISC processors and two floating-point coprocessors. The 910-624 has four 25-MHz processors and four floating-point coprocessors.

Each 16.7-MHz processor is able to process 13 million instructions per second (MIPS), and each 25-MHz processor can handle 21 MIPS, the firm said.

CDC said it will target the series at industries involved in computing-intensive, graphics-reliant applications such as computational fluid dynamics, molecular modeling, mathematical theory and computational chemistry.

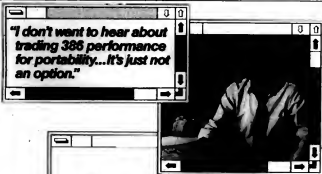
A new high-speed bus between the central processor subsystem and the graphics subsystem results in graphics performance of 400,000 three-dimensional vectors per second, the firm said.

The machines run the Iris operating system — CDC's multiprocessor version of AT&T's Unix System V, Release 3 — and are compatible with Cyber's 910-400 and 910-500 series workstations, CDC said.

Standard software on the 910-600 series will include the Iris operating system, a C compiler and development environment as well as a window manager and graphics library.

The models also include a 182M-byte disk drive as well as 684 bytes of error-correction code memory. Memory can be expanded to 64M bytes on the base memory board.

The 910-612 is priced at \$94,900, while the 910-622 sells for \$114,900. The 910-624 is priced at \$139,900.



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Pharmacy net

CONTINUED FROM PAGE 23

or magnetic strip reader. The system automatically links up a database located on a Stratus computer at the drugstore's headquarters or at a third party such as Medicare or Blue Cross/Blue Shield. The database is then searched for information regarding the patient's eligibility.

The product, to be marketed by both firms, is targeted at large retail drug stores with \$200 million in sales. However, the application could be used by other health care organizations such as hospitals, insurance firms and health maintenance organizations.

"Most pharmacies in the \$200 million range just take cards with no verification," said Dick Jacobson, retail industry marketing manager at Stratus. He said large pharmacy chains can justify the investment in the hardware and software in one year.

The cost of the system ranges from about \$79,000 to \$1 million, depending on the configuration, according to Stratus, with the cost being split between hardware and software.

ESA

FROM PAGE 23

ry requirements to move data into expanded memory.

One key benefit, he said, will be to provide faster access to common services in VM. For example, VM provides a common server for advanced printing. When a large number of users are accessing a single common service, a bottleneck can occur. ESA will allow data to be kept in expanded memory.

"There may be 1,000 users, and they may not need huge amounts of data, but they will need to access the same data frequently," McNamara explained.

Ronney White, vice-president at Velocity Software, Inc., a Boston-based maker of VM utility software, concurred that this move would serve to boost performance. Currently, data has to be copied from one server's address space to another's. "I'm assuming you could share a data space between virtual machines," White added.

However, he noted that implementing ESA under VM will require users to purchase the expanded memory that will make the added function possible.

"IBM is trying to find a way to sell expanded storage to VM us-

ers," White said. He said users are not clearing for capabilities of ESA. "This is a solution looking for a problem," he added.

One VM user, who asked to remain anonymous, said ESA capabilities are indeed a blue-sky proposition at this point. "It's an area where we don't know what capabilities we would use." He said improvements under VM/XA SP 2 offer better CPU utilization and should satisfy his needs for the present.

More users

According to McNamara, ESA will almost certainly allow VM to support more users. Currently, VM/XA can handle up to 5,000 users for IBM's Professional Office System. An ESA version of VM will allow twice that amount or more, he added.

In addition, ESA will allow the number of logical partitions under PRISM to increase. Currently, VM/XA SP 2 supports a maximum of six partitions, although up to seven are supported on the largest IBM 3090 S models running MVS.

A VM with ESA will "definitely have Data Spaces," McNamara said. Hiperespaces under VM would work differently than under MVS and might thus carry a different name to avoid confusion, McNamara said.

Spirits

FROM PAGE 25

and compatible with all of the inter companies' operating environments," Greggor explained. However, he said he did not want to incur the additional expense of full-time staff programmers to build and maintain the software.

According to Greggor, the key to the decision was that sister company Carillon Importers Ltd. in Teaneck, N.J., which operates similarly but separately, was in the same position and could share the cost. As a result, each company paid \$600,000 of the \$1.2 million tab for the hardware, the customized software and VM/IS. Carillon, however, uses the IBM 9370 Model 50.

Paddington and Carillon decided not to use an IBM MVS-based distribution package developed by sister firm Houlden, Inc. in Farmington, Conn., which runs it on an IBM 3090 mainframe. According to Greggor, "The MVS solution would have required the additional cost of reprogramming for VM/IS and an IBM 9370 Model 90." Furthermore, the application "would have required too many people to maintain it."

The other solution, the Distribution Control System from

Arthur Andersen & Co, would have cost about \$200,000, Greggor said. "Competition would have driven the price to over \$1 million and required at least two full-time employees to run the software." Greggor added that he would have had to run IBM's DOS/VS operating system, incurring the additional overhead of system programming personnel.

Penetration later

Greggor had both the financial and the distribution systems, which are based on Focus, the fourth-generation database management system from Information Builders, Inc. in New York and built by Howard Systems International in New York.

Although the distribution package is completed and running, the financial package will not run until the first week of March. Fortunately, Paddington has a long lead time on orders, which are not scheduled to be posted until the March switch-over. Meanwhile, the orders are being entered into the 9370.

Greggor said that by next year, every employee will have access to the system. He also plans a connection to the company's suppliers in the UK, who support about 60% of Paddington's business.

Sequoia

FROM PAGE 23

two processors is priced at \$450,000. Both configurations include two 850M-byte disk drives, a 6250 tape drive subsystem and a license for the Sequoia operating system. Topix. The operating system is Sequoia's blend of the AT&T Unix System V operating system and Pick Systems' Pick operating system.

Johnson said the firm has tested the new system with the Delt/Credit benchmark, the evolving standard benchmark being defined by the Transaction Processing Performance Council.

Sequoia plans to make these results available in three months. Johnson said the company also intends to have the results audited by an outside firm.

According to Johnson, initial results show that the Series 300 offers 50% more performance than the Series 200, which underwent benchmark tests last year. The 200 performs an estimated 14 transactions/sec. per processor, Johnson said.

Since it was founded in 1981, Sequoia has remained a distant third to competitors Tandem Computers, Inc. and Taurus Computers, Inc. in the on-line transaction processing market.



The best route between your Novell LAN and a mainframe is just ahead.

Gibson

FROM PAGE 25

goes on and then simply certifying that he watched it — not that what took place was scientifically correct.

It is as though an auditor sat through a magic show, witnessed a rabbit being pulled out of a hat and then wrote up a report in which he certifies that he saw a rabbit being pulled out of a hat — that is, if the rabbit were indeed a rabbit and the hat were indeed a hat, facts for which he clearly cannot be responsible.

What the user community needs is someone to explain the rabbit-out-of-the-hat trick.

Ready when you are. Early Enterprise Systems Architecture users say that they are finding the system easy to install, but once they have it, what do they do with it? One user proclaimed that he was "positioned for the future." Sounds a lot like an expression that got its start within the hallowed halls of IBM. You may not need it now, but you will be "positioned well" for when you do — as if it will be obtainable by then.

MIS mentor George D'Nardo, executive vice-president

at Mellon Bank NA in Pittsburgh, once termed moving to ESA a no-brainer. Without question, it is being done on a large scale by big 3090 shops, particularly those moving to S models.

IBM will be dribbling out ESA-based goodies, such as the recently announced Hyperport. Why not put yourself in a position to use them as they are released? But let's keep track of the flow of goodies to see that there is a generous supply.

Alma. VM will be getting ESA, as indicated elsewhere in this section, but will it be able to support a 3990 Model 3 controller first?

Part of IBM's Feb. 7 announcement was that, indeed, the basic functions of the 3990 Model 3 will be supported by VM/XA SP Release 2.

When? December 1989. Advanced functions were not mentioned by IBM.

"Somebody overlooked something. It's a hell of a way to treat a strategic operating system," said VM guru Romney White of Velocity Software in Boston.

Gibson is Computerworld's senior editor, software.

Bozman

FROM PAGE 23

Semiconductor, it will soon be an independent unit of Memorex Telex.

"NAS has not been a very strong force in our marketplace over the last 18 months," said Amdahl President and Chief Operating Officer Joseph Zemke at an analysts' meeting recently. "We've always felt we controlled our own destiny and that we have a unique relationship with Fujitsu. I think our strategy and the execution of that strategy is probably what resulted in NAS being on the block."

Marketing Vice-President Ted Springsted pressed the same point as he counted down an impressive list of Amdahl's recent "wins." Among the most gratifying of sales,

Springsted said, was the displacement of a four-way NAS processor at Baxter Health Care in suburban Chicago. Several Amdahl high-end machines recently went to Mobil Oil and Monsanto — both traditional IBM shops. Other machines were shipped to the Federal Reserve Banks in Boston and Atlanta.

Yet NAS, despite its troubles, is still landing machines in

high places. In the last three months, NAS has placed large machines at Delta Air Lines in Miami, McDonnell Douglas in St. Louis, Boeing Aerospace in Seattle, Chevron in San Ramon, Calif., and Goodyear Tire & Rubber in Akron, Ohio. It is selling nearly \$1 billion in hardware systems each year in comparison with Amdahl's \$1.5 billion.

Good for the competition. Friendly rivalries aside, keeping NAS in the game is actually good for Amdahl's business, says industry analyst Bob Djardjevic, president of Amex Research in Phoenix. Traditionally, NAS has been the price-leader in the IBM mainframe market. But, as part of Memorex Telex, that probably will not be possible anymore, and the market will tighten.

But it seems that the simple act of acknowledging NAS' continuing role as an IBM competitor would underline the fragility of the PCM marketplace. IBM has, by varying analyst accounts, 80% to 90% of the worldwide IBM mainframe market. All PCMs combined — including Siemens AG in West Germany — sell just 11% of all IBM-compatible mainframes.

Outside observers have not

ed that NAS, if folded into Memorex Telex's \$2 billion-plus empire, would make the overall company a \$3 billion PCM giant. This Memorex conglomerate would have a much broader product line than Amdahl's offerings. Memorex Telex executives have stated on the record that such a merger may be the eventual plan. But a full-blown merger will not happen until outside financing is raised to buy National Semiconductor's 50% share in NAS.

Let us hope that, despite Amdahl's rivalry with NAS, Amdahl's recent comments are just a facade. There was one sign, at least, that Amdahl felt some empathy with NAS' new situation. "It's always a little unsettling when one of your competitors is on the block," Zemke said. "We're just glad the deal came down and that all the speculation is over."

Maybe a touch more of that empathy would do Amdahl some good. For, as Ben Franklin warned those who wanted to go their separate ways on the eve of the American Revolution, "We must all hang together, or assuredly we shall all hang separately."

Buzman is Computerworld's West Coast bureau chief.

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NEW PRODUCTS —
SOFTWARE

System software

Computer Associates International, Inc. has announced Release 5.3 of CA-Dynam/TLMS, its automated tape volume and tape data set management system for the IBM MVS operating environment.

Enhancements reportedly include a direct interface to CA-11, the company's automated run and tracking system. The software package also includes the extension of expiration date support through the year 2049, the vendor said. Pricing ranges from \$15,600 to \$36,300, depending on configuration.

Computer Associates
711 Stewart Ave.
Garden City, N.Y. 11530
516-227-3300

Database management systems

A program said to reorganize IBM DB2 databases twice as fast as the supplied DB2 utility has been announced by BMC Software, Inc.

Called DB2 Reorg Plus, the product reportedly provides space management statistics and produces single- or dual-image copies with each reorganization. According to the vendor, the package improves performance and lowers costs by reducing CPU cycles.

A perpetual license for DB2 Reorg Plus ranges from \$15,000 to \$51,250, depending on CPU type.

BMC
P.O. Box 2002
Sugar Land, Texas 77487
800-841-2031

XA Systems, Inc. has announced a product for IMS Fast Path database users.

According to the company, IMS-Xpert Fast Path option will enable users to initialize, extract, load, edit and browse information located in the Fast Path database. The option — which works in conjunction with the IMS-Xpert System and software designed for manipulating IBM databases under TSO/ISPF, IMS/DC or CICS — is priced at \$10,000.

XA Systems

Building D
983 University Ave.
Los Gatos, Calif. 95030
408-385-1800

Information Builders, Inc. has unveiled a read-only interface between Focus for Digital Equipment Corp. VAX fourth-generation language and database management system and Software AG of North America's Adabas DBMS.

The Adabas interface allows Focus' reporting, graphics, spreadsheet and data analysis facilities to directly access data stored on the Adabas system. The software runs in a DEC VAX/VMS environment and is priced from \$1,750 to \$14,000.

Information Builders
1250 Broadway
New York, N.Y. 10001
212-736-4433

Development tools

Zasthe Information, Inc. announced that its fourth-generation application development environment is now available on the Unisys Corp. US5000 series of Unix-based computers.

Zim is reportedly based on the entity-relationship data model and includes a data dictionary, database query and update and forms manipulation functions.

Pricing for the Unisys US5000 version ranges from \$5,700 to \$37,500.
Zasthe
1200-38 Antares Drive
Ottawa, Ont. Canada
K2E 7V2
613-727-1397

Languages

Oregon Software, Inc. has announced that its Pascal-2 compiler is available for Intel Corp.'s 80386-based machines running the Xenix operating system.

Pascal-2 Version 2.28
Xenix/386 reportedly includes a debugger, assembly language interface, source-code formatting and procedure cross-referencing capabilities. The latest release costs \$995 for a single-user license and \$250 per year for support services.

Network licenses are also available.

Oregon Software
6915 S.W. Macadam Ave.
Portland, Ore. 97219
503-345-2202

Philco, Inc. has released Philco Fast/Cobol 1.5, a language compiler for Motorola, Inc. 68000 series-based systems running under Unix.

The latest version reportedly conforms to ANSI standard-

based Cobol X3.23-1985. The vendor said the product has been undergoing National Institute of Standards and Technology validation at the intermediate level since January, and a full high-level release is planned for release in the second quarter.

Philco Fast/Cobol 1.5 costs \$2,200.

Philco

641 Avenue of the Americas
New York, N.Y. 10011
212-807-0303

Applications packages

Prime Computer, Inc. has released ComputerVision Caddé 4X Revision 4, a computer-aided design system.

According to the company, the product provides integrated nonuniform rational b-spline geometry and solids modeling capabilities.

Features include the automatic execution of solids modeling operations, the ability to cut a solid with a sculptured surface and a production visualization package.

Caddé 4X Revision 4 is priced from \$10,500 for software only. Prime
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The WY-150 also sets new ergonomic standards. Its 78 Hz refresh rate, eliminates any hint of flicker. Just as overscanning and a bezel that matches the soft, paper white phosphor erase distracting borders. (Amber and green phosphors are also available.) The oversize 10x16 cell makes each crisp character stand out vividly.

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MICROCOMPUTING

MICRO BITS

Douglas Barney

Lotus lockup period to end

Lotus' case of silence. For much of its history, Lotus has been close-mouthed about new products and future strategies. Getting information was worse than pulling teeth — at least teeth usually come out.

In April 1987, the company tried an experiment. At its annual shareholders' meeting, the firm unveiled ambitious plans: Lotus' 1-2-3 Release 3.0; 1-2-3/M, along with a 10-year co-development agreement with IBM; 1-2-3/G; and perhaps most surprising, Lotus/DBMS, an advanced multitier database with an array of graphical front-ends. It also talked about Symphony 3.0, a version of the five-function beast that will use 1-2-3 Release 3.0 as its core.

This orgy of press announcements was followed by a week of demonstrations and festivities called Lotus Week. This was the new, open, likable Lotus.

The company has been trying to live down that fateful day ever since. That is because nearly two years later, none of the important stuff announced at Lotus Week has shipped, a situation that has earned the firm

Continued on page 31

OS/2 users search for puzzle pieces

BY DOUGLAS BARNEY
ON STAFF

After more than a year of availability, there is a host of corporate users anxious to get cracking with OS/2.

But these pioneers, with development projects already under way, are still waiting for all the pieces to come together, users said in recent interviews.

Here is what users said they need most:

- Key applications for OS/2 character and graphics modes.
- Broader distribution of Micro-soft Corp.'s OS/2 LAN Manager and IBM's LAN Server.
- Lower memory and hardware prices.
- Ashton-Tite Corp./Microsoft/

Sybase, Inc.'s SQL Server and other database server technologies.

• SQL-oriented development tools.

Bob McLean is one of many users who have been essentially completing internal OS/2 applications. His firm, Host International, Inc. chose OS/2 for its 110 airport snack and gift shops to gain large memory and multitasking. Once it is up and running, and users will be able to do background processing.

"We have had a lot of instances where someone will want to shut down the system to let someone else do something," McLean said. That will end with OS/2.

But because Host's account-

ing system is tied into a variety of off-the-shelf MS-DOS applications, McLean must wait for OS/2 versions of tape backup, word processing and spreadsheet software. "Until they get here, we won't install it," he said. McLean said Host hopes to have the system in production by the third quarter, software vendors willing.

A. C. Nielsen Co.'s Nielsen Monitor-Plus in Wilson, Conn., also has ambitious plans for OS/2. Its main task is to track and analyze the impact of television commercials.

Project manager Rick Martin is spearheading the downing effort that will eliminate the need for the firm's Amadahl Corp. mainframe within two years. An-

choring the final stage of the downing will be the SQL Server that runs under OS/2. Martin is still waiting for the spring release of SQL Server and the second-quarter release of Sybase's across tools.

Once these products are available, Martin and crew will

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Inside

- IBM low-end systems president stays the course. Page 35.
- Apple discounts high-end models' prices. Page 35.
- Videotex releases electronic photography combo. Page 43.

Cornering the stock market

Micro vendors vie for brokerage desktop spots

BY WILLIAM BRANDEL
and DOUGLAS BARNEY
ON STAFF

Wall Street is not just a hotbed of trading activity; it is also a hotbed for vendors of high-performance desktop computers. These firms are currently trying frantically to carve a slice of the lucrative trading market.

Although there is an array of offerings, the trend is clearly toward fast IBM and compatible personal computers with graphical user interfaces. However, brokerage firms handle many different types of trading, requiring different types of sys-

tems. Thus, PCs may never replace every Quotron Systems, Inc. terminal or high-end workstations. They may, though, ease out the majority.

PC allure

Part of the PC's allure is software. A hot player in this market is New York-based Maltex, Inc., a firm that has made steady inroads on Wall Street. Its products vary, but what they basically do is allow the user to take in real-time information using Lotus Development Corp.'s Signal and dump the information into pop-up windows using Microsoft

Continued on page 41

Exec info systems catch on

BY MICHAEL ALEXANDER
ON STAFF

The software industry is readying to put senior executives on-line with executive information systems (EIS) in a big way, according to a recent study conducted by International Data Corp. (IDC).

Several information technology executives said they are seriously evaluating EIS but that software vendors will have to do

a better job of tailoring their products to the needs of their executives and to personal computer-based networks.

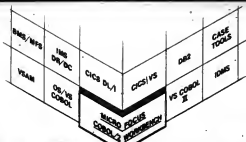
IDC, a Framingham, Mass.-based market research firm, predicted that the U.S. market for EIS will grow at a compound annual rate of nearly 40%, up from \$22 million in 1987 to \$115 million in 1992 (see story page 130).

IDC noted that expenditures for EIS software development, including the purchase of software, custom consulting and in-house software development, will climb to nearly \$350 million in 1992.

Executives traditionally have been reluctant to devote valuable time to learning and developing their computer skills, but

Continued on page 40

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General Manager
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SMALL
TALK

Michael Alexander

It's never
too late
to learn

A friend called me recently.

He's a top executive at a luxury hotel that is in the midst of undergoing a significant — several million dollars' worth — renovation. For more than a few months, he has been wrestling with selecting and installing a costly computer system for the hotel's front-end operations.

After we had lamented the end of the football season, compared the weather on each side of the country and exchanged other pleasantries, my friend began recounting his difficulty with making sense of all of the new technology he has been forced to absorb.

He has had to talk to dozens of vendors, compare several bids, even attend classes to get a better fix on what is considered state of the art in the hotel business. He admitted that many times he has been utterly baffled by the technology.

During our conversation, he asked me whether I thought he should personally use a desktop computer. "After all, I can't be expected to be a typist, but on the other hand, I can't help but think that it would be easier for me to understand the hotel's computer needs," he said.

After mulling it over for several seconds, I replied that I

Continued on page 40

IBM's new low-end systems
president stays the courseBY WILLIAM BRANDELL
OF WASH.

BOCA RATON, Fla. — In many ways, IBM's new Entry Systems Division President, James Cannavino is like U.S. President George Bush. In both cases, staffers speak of a "kinder, gentler" approach.

But like any high-ranking politician, Cannavino must sell a skeptical industry on an ambitious strategy, which in this instance includes selling a memory-demanding OS/2 and OS/2 Presentation Manager operating system combination while memory prices are still high. Most users continue to balk at the expense of upgrading to an operating system that has precious few important applications. That will not change until DRAM becomes viewed as a nice four-letter word again.

As the successor to William Lowe, a long-standing IBM executive, Cannavino also speaks

of staying the IBM Personal System/2 course. Part of that message includes the reiteration of the overall Micro Channel Architecture (MCA) strategy. Cannavino said that the MCA will improve in an evolutionary, competitive manner. In short, there will be no new Micro Channel, as published reports had speculated.

In other words, expect business as usual in IBM's low-end systems product strategy under Cannavino. "I don't see any major changes in store," Cannavino said in an interview at IBM's Boca Raton facility last week. In fact, most believe that IBM's most dramatic Personal Computer announcements, such as OS/2 and the MCA, have already been made.

Coming-out party
The week marked Cannavino's coming out, his first major public appearance since succeeding Lowe in December. The

straight-talking Lowe resigned as president of the Entry Systems Division to take an executive position at Xerox Corp.

When Cannavino's promotion was announced, IBM corporate customers were still anxious to see a compelling reason to switch to the MCA, such as add-in boards that would provide previously unseen capabilities. They were also anxious to learn how the PS/2s they had already purchased fit into IBM's Systems Application Architecture (SAA) strategy. These two issues are only slowly being explained by IBM.

Cannavino acknowledged that new MCA-based products are in the offing. These include systems using the Intel Corp. 80386SX processor as well as a laptop using the MCA. Further details were not forthcoming.

Dangerous approach
While analysts speculated that Cannavino's mainstream background would lead to a repositioning of the personal computer in IBM's strategy, that is not entirely the case. Cannavino, however, did caution that PCs should interact with mainframes in fairly limited ways.

For instance, Cannavino cited the danger inherent in "notions that workstations would have direct access to mainframe operations."

"When you give the PC direct access to the mainframe, you are interrupting six tons of muscle to let it know that you're a key.

That is not efficient use of a network or your mainframe," Cannavino said. "You want your mainframes to mainframe." He added that with the proper system role definitions, workstations will not cannibalize IBM mainframe sales but complement them. This runs contrary to the dominating position that credit PCs with the certain demise of the mainframe.

Despite being so about IBM's plans to create synergy between mainframes and microcomputers, Cannavino hinted of things to come. "We are right on the edge of an explosion," he said of the PS/2 family. "In 1989, it will become obvious why we did what we did with

the Micro Channel. Soon you will be able to drop in a bus master card that will make a Model 50 perform like a Model 70."

The new IBM PC chief argued that customers are not displeased with the quantum leap from Personal Computer AT-based systems and applications to the MCA. But while stating that he expects MCA sales to eventually overwhelm AT-based systems, he also said there are no plans to ever discontinue the AT line. "We have had very little — if any — reaction from our customers saying, 'You did the Micro Channel thing wrong.' But nor are any of us going to give up the PC market opportunity," he said.

As Lowe did, Cannavino argued that upcoming versions of the PS/2 will support multiple users on a single hardware platform. "You get a system as sophisticated as OS/2, and multi-user is not a long way to go," he said. And like Lowe, Cannavino was vague in laying out the details of OS/2 multitasking strategy.



IBM's Cannavino

Data View

Driving up and down

If 1991 shipments of microfloppy disk drives are projected to outnumber those of 5 1/4-in. floppy by a margin of almost 3-to-1



SOURCE: DATA/RESEARCH, INC. (514) 476-0000

Apple continues to slash Mac prices

Discounts offered to high-end users buying in volume, through resellers

BY JULIE PITTA
OF WASH.

CUPERTINO, Calif. — Apple Computer, Inc. has taken another stab at lowering prices for higher-end models of its Macintosh personal computers through new discount programs for end users.

According to an Apple spokeswoman, peripherals for the Mac have been dropped in price by up to 50% for customers who buy through resellers. Further, customers who buy through resellers will receive a rebate. The discount applies to the Macintosh II and Macintosh

IIx, the Macintosh SE and the Apple IIGX lines.

National accounts — users who buy in volume — will receive free systems per each large order. For example, a national account will receive a free Macintosh II with a 40M-byte hard disk drive for every four Mac IIs it buys. Customers who purchase Mac SEs with dual-floppy disk drives will receive a free system for every 11 units they purchase.

Peripherals too
High-end peripherals and systems are eligible for better discounts under the program.

"We're attempting to achieve parity between the two programs," the spokeswoman explained. "It will be their choice whether they purchase through the dealer or through Apple; they won't be penalized for either decision."

Both promotions will be in effect until March 31.

Apple is attempting to redirect sales toward more fully configured systems in its product line, the spokeswoman noted. Last summer, Apple raised prices for its more fully featured Macs by between \$400 and \$1,000. The price hike was greeted with widespread criticism from Apple customers.

As a result, demand shifted toward Apple's less expensive, less fully configured Macintoshes. At the same time, Apple began purchasing memory components at industry-high prices in an attempt to meet customer demand.

Subsequently, prices for dynamic random-access memory (DRAM) decreased, leaving Apple with its stockpiles of expensive memory chips and customers who wanted stripped-down Macs.

Revenue decrease
Apple reported that revenue is expected to drop in the current quarter because of the price increases and the decision to stockpile memory.

In January, Apple made its

first move to alter customer buying patterns, trimming prices on higher-end Macs and peripherals.

Mike Bailey, president of Apple Professionals Exchange and a systems integrator at Lockheed Martin and Space Co., said price reductions are a step in the right direction.

"They're trying to stimulate sales," Bailey said. "They've made some tactical errors and now they're trying to do some damage repair."

"They're especially trying to stimulate more activity in the corporate market," he continued. "I think they turned off some large customers with the increases last year."

However, Bailey said Apple salespeople have yet to approach him regarding the discount.

OS/2 users

CONTINUED FROM PAGE 31

completes the job of porting both local-area network and mainframe applications to SQL Server.

NASDAQ, Inc. has completed work on an OS/2 server-based application for software distribution. The program, aimed at systems administrators, will distribute the software to 1,400 traders. The server will hold data files and program files for users and will provide the most up-to-date software for each. Unlike other firms, NASDAQ has all the pieces in place.

NASDAQ's OS/2 application will save the firm time, effort and money. Today, whenever there is an update to the workstation software, NASDAQ's MIS staff has to produce and distribute 1,400 floppy disks, many with specific configuration information, which takes five to seven days, Flynn said. Once the OS/2 system is up and running, that same task will take 45 minutes. The firm also plans to begin designing a system that will bring OS/2, and eventually IBM and Microsoft's OS/2 Presentation Manager, to traders' workstations. There is no time frame for these projects.

Microsoft Windows advocate Art Block is willing and anxious to move to OS/2. Block's Intel Corp. 80386-based micros with high-resolution graphics and 4M to 8M bytes of random-access memory are also ready. The Presentation Manager Trust Co. vice-president said he is simply waiting for OS/2 Presentation Manager applications. Like so many other pieces, there is no telling exactly when these applications will arrive.

Barney

CONTINUED FROM PAGE 31

a reputation for putting its vapor where its mouth is. The only thing that has changed since then is the company's image.

For a while after Lotus Week, the firm was still forthcoming. It announced Blueprint, a communications protocol, 1-2-3/Mac, and a version of 1-2-3 for DEC's VAX.

Forget what we said

But the product delays have hurt Lotus badly. And, it seemed, every time the company announced a product, the press and competitors would simply point to all the unshipped ones. Lotus would prefer we forget that series of overzealous announcements. In fact, we often do and have to look up old press releases to remember what was said so long ago.

Lotus is not entirely to blame for its delivery problems. Lotus/DBMS and 1-2-3/G both require the IBM and Microsoft OS/2 Presentation Manager, an environment that many still call unstable. Release 3.0 was developed largely under OS/2 and has had difficulty fitting back into the lesser confines of MS-DOS. These factors have made Lotus no less sensitive to the barbs that are a part of everyday life for key company execs.

So Lotus has gone back to its roots and decided to shut up. It isn't on the front page anymore. It isn't even on the back page. It is simply biding its time, waiting to ship some stuff so it can start to brag again. Like Ronald Reagan, the company apparently prefers no press to bad press. In short, Lotus has gone dark.

This is not entirely bad. But it is not entirely good either. You see, customers still need information about when things are coming, what they will look like, what they'll require and how much they'll cost. Lotus is barely talking about products it announced nearly two years ago.

Another pretty interface

For instance, I like database software. I don't really use it. I just like to look at it. If I want to simply look at a prototype, Lotus/DBMS, I have to sign a nondisclosure agreement. If I ask how much room I'll have in a 640K-byte machine for a spreadsheet under Release 3.0, I still get a "no comment." Even some large corporate customers are getting this silent treatment.

Lotus won't keep quiet forever. At every corner of the company, groups are excited about their projects and anxious to talk. But the pressure on employees to keep things secret is no measure that some have coined the new corporate slogan, "Loose Lips, Sink Ships."

The cox's started to pop out last week when the firm finally announced beta shipments of 1-2-3 Release 3.0. But information is still slow to seep out. Even though disks are falling into users' hands, Lotus has yet to let us in on such details as whether the system will require an IBM Personal Computer AT or above and how much memory will be needed to get some useful work done. From there, there are just a few more areas in need of elaboration, such as Lotus/DBMS, 1-2-3/G, 1-2-3/Mac, 1-2-3/VAX and Symphony 3.0.

Barney is a Computerworld senior editor, alternate copyediting.

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NCR

Info systems

FROM PAGE 31

new technologies are shortening the training time. Graphical interfaces, mice, touch screens and other tools enable executives to quickly learn how to use information systems, IDC researchers said. Not only do these tools make it easier for execu-

tives to use information technology, but they also flatten the learning curve, making the process more economical, according to IDC.

MIS is finding it easier to design EIS programs, thanks to the increasingly widespread availability of powerful application development programs and relational database technology, IDC reported.

"In a nutshell, its time has come," said Lloyd Belcher, coordinator of executive information systems at Cosco, Inc. in Houston. "The components that have been brought together are technology, namely the PC and local-area networks, and a realization that information is a commodity."

There is also the awareness on the part of executives of the

value of information as a competitive weapon, he added.

"Classical mainstream orientation was toward getting large reports to an executive rather than data," Belcher said.

Cosco has spent five years developing and refining its EIS, according to Belcher. "It has not been totally painless," he conceded. "The interesting thing is

when you start, the executives don't know what they want."

Information systems managers have learned from past mistakes in efforts to implement EIS. Often, an EIS failed because of the inability of executives "to describe an indescribable product," Belcher said.

Software lacking

While most IS managers agree that the hardware technology is adequate for EIS, the available software is lacking.

"From the point of view of MIS, the software is really not there yet," said Howard Camper, data center director at Ashland Oil, Inc. in Lexington, Ky. "It's a question of, do you want to roll your own environment and have to maintain it for the rest of your life or wait for the commercial stuff? When we last looked at it a few years ago, we weren't satisfied. We're looking at it again now, though."

Much of the available com-

Alexander

FROM PAGE 35

could not see how he has managed to get by for so long without a personal computer on his desk.

Given the competitive nature of the hotel industry and the demands of harried business travelers who want to check in and out at blinding speed, choosing the right computer system has long-term, strategic importance for the hotel. It's a big-money decision that only comes after considerable deliberation.

If you had at least a working knowledge of PCs, it would go a long way toward helping you make the bigger decisions on how to strategically use information technology, I said. Using PCs may be the only way that you can learn what information technology can and cannot do.

What's more, I said, your use of a PC, even if only occasionally or for a specific task, sends a message to every staffer — especially the executives who report to you — that using information technology is vital to the hotel's competitiveness.

I am familiar enough with my friend's job to know that much of his time is spent poring over spreadsheets that detail room occupancy rates, food and beverage sales, salaries and benefits and similar information. When the numbers don't jibe or when he decides that he hasn't had enough "grunt it" to ponder, he asks a subordinate to rerun the numbers on a PC and produce new spreadsheets. It usually takes a few days before all of the information my friend needs is back in his hands. I told him that if he knew at least enough about PCs to manage numbers in a spreadsheet,

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mercial software is not adequate, concurred Tim Crowell, vice-president of the LAN group at NCNB Texas National Bank in Dallas: "Most of what we have seen is mainframe-oriented." The bank is in the midst of evaluating a variety of packages and intends to implement an EIS by year's end, Crowell added.

"What we have determined from our managers is that they only want specific pieces of information, and the mainframe-types of reports are just too large," he said. "It definitely has value to us, but the executives have only so much time for decision making, and they need to do it on a specific set of information on a system designed for them."

EIS may not be the best approach for increasing the information flow among all executives, IDC warned. Some of the factors to consider are the competitiveness of the business environment and the value placed on information as a resource.

It would not only save him considerable amounts of time, it would help him make quicker decisions.

The hotel business is bound to get together, especially in the nation's biggest cities where there are more hotel rooms than bodies to fill them. The demands at the front desk are probably going to be small compared with the demands in the executive offices, I said.

Not being able to type, of course, is an excuse that many executives use in an attempt to mask their fears of having to learn something new or as challenging as using information technology.

I know quite a few exceptionally fine writers who cannot imagine what life was like before word processing, yet can barely find the top row of keys on a keyboard. My friend is really no different than they are; he just doesn't know it yet.

I suspect that many information center managers know executives in their companies whose attitudes toward PCs are quite similar to those of my friend. Unfortunately, it is easier to buy into the argument that executives don't want to learn how to type as the reason for not putting PCs in top offices.

But what is apparent to me is that at companies in which end-user computing is blossoming, the push for using PCs strategically emanates from the top down. I don't think that my friend will order a PC for his office any time soon. But I think he now recognizes that the value of using a PC is not solely in being more productive but in the understanding of the technology and how it is used outside the executive offices.

Alexander is a Computerworld senior editor, alexander@comp.com.

Cornering

FROM PAGE 31

Corp.'s Windows. The users can then reconfigure the menu or interface as they deem to perform market data applications such as real-time analytics.

As each broker has his own "feel" for the market, he can configure the analytics using whatever real-time or historical data he considers significant. The information that he pulls up is used to determine if and when he will perform a stock or bond transaction.

Fidelity Investments. Boston-based Fidelity Investments is now implementing a system based on the Muxtel approach. Using the Muxtel menu, a bond salesman can address historical data on both the market and the client to assure that redundant phone calls have not been made. The salesman also knows what information has been sent to that particular client. Fidelity is implementing this technique on a Fidelity Personal System/2.

One of the important features of the Fidelity approach is the use of Muxtel's IBM 3270-based terminal emulation product. Using the terminal emulation in a pop-up window, the user has direct access to information on the mainframe. This means that computing-intensive applications such as a database search are processed on the mainframe, while the remainder of the activity can be done on the PS/2.

Goldman, Sachs & Co. Goldman Sachs is also using Muxtel

software. Using the menu, Goldman Sachs traders can pull up different market data sources, perform analytics, read "pages" of market information and access data from in-house computers. Goldman Sachs is using this technique to replace costly dedicated terminals.

Merrill Lynch & Co. This Wall Street fixture has a variety of workstation approaches depending on the needs of specific traders. For instance, its headquarter

group, however, a PC system using Windows has been in place since 1987.

NASDAQ, Inc. NASDAQ traders are currently using PCs with a customized multitasking system that sits on top of MS-DOS, said Ed Flynn, assistant director of software development at NASDAQ. The organization plans to stick with the tried and true Intel architecture but will boost functionality with eventual moves to more sophisticated op-

erating systems. Chief among the operating systems candidates are Windows, OS/2 and Microsoft and IBM's OS/2 Presentation Manager, Flynn said. The goal for high-end systems will be the OS/2 Presentation Manager, while desktop workstations tied to servers will most likely run Windows, Flynn said.

Prudential-Bache Securities, Inc. Prudential-Bache is a brokerage house in transition. It currently has a variety of trading systems but is developing a plan for a more unified future. "Today, they have all kinds of systems," said Mohammed Moamad, senior vice-president of information systems operations and support at Prudential-Bache. "They don't have one integrated device."

Prudential-Bache is installing intelligent workstations right where the stock specialists sit but is still grappling with the space constraints. If anyone has developed a high-end microcomputer the size of a shoe box, give Joel Beier a call. Beier is working with even smaller devices. The NYSE is currently testing a handheld version of the PC.

Within the so-called trading booths there is even less room. Because there is hardly any space for a keyboard, touch-screen devices are the rage. These systems are tied to remote DEC VAXs.

The organization is looking at installing intelligent workstations right where the stock specialists sit but is still grappling with the space constraints. If anyone has developed a high-end microcomputer the size of a shoe box, give Joel Beier a call. Beier is working with even smaller devices. The NYSE is currently testing a handheld version of the PC.

THE IDEAL workstation will have the ability to access different hosts, multiple data services and will need good presentation capabilities.

ters staff will be using PCs with Windows that will primarily focus on finance and accounting applications, said Gordon Solars, vice-president of distributed systems.

Equity traders at the firm will most likely use high-end workstations from vendors such as IBM, Sun Microsystems, Inc. or Digital Equipment Corp. For these highly demanding applications, the hardware is chosen on an almost case-by-case basis, said Don Trojan, vice-president of equity trading systems. As a result, Trojan is looking at the most open elements possible, including Unix, ANSI's X.11 as a windowing standard, Transmission Control Protocol/Internet Protocol for networking and C as the programming language.

At the firm's municipal trad-

ing group, however, a PC system using Windows has been in place since 1987.

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NEW PRODUCTS

Systems

Iverson Technology Corp. has announced three Timestep personal computer systems based on the IBM Personal System/2 Models 30, 50 and 60, the company said.

Two of the systems, the ITC PS 30T and the PS 50T, are reportedly approved for the federal government's Preferred Products List. The third product, the ITC PS 60T, was designed to meet the Nacsis 5100A specification.

Prices start at \$3,000 for the PS 30T, \$4,325 for the PS 50T and \$6,600 for the

PS 60T. All include a 90-day warranty.

Iverson Technology
1356 Beverly Road
McLean, Va. 22106
703-749-1200

A 25-MHz Intel Corp. 80386-based portable computer is now available from Dutch Computer Systems.

The Dutch-PAC is reported to be an IBM Personal Computer AT-compatible system with 64K bytes of disk-caching and a zero-wait state microprocessor. The system incorporates six expansion slots and both serial and parallel ports. Pricing for a unit with 4M bytes of ran-

dom-access memory and a 40M-byte hard disk starts at \$9,495.

Dutch Computer Systems
2029 O'Toole Ave.
San Jose, Calif. 95131
408-435-1861

A handheld personal computer has been unveiled by Corvallis Microtechnology, Inc.

Dubbed the MC-V, the Intel Corp. 8088-based unit reportedly weighs 26 ounces and offers support for several programming languages and software platforms. The system is targeted at professionals in engineering, land surveying, forestry, medical records management and sales-route accounting.

Standard features include 256K bytes

of random-access memory, two RS-232 interfaces and an internal heater. The MC-V costs \$1,450.
Corvallis
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Corvallis' MC-V

Epson America, Inc. has introduced the Equity II desktop computer for business and personal applications.

According to the company, the small-footprint computer can be used stand-alone or as a network workstation. Standard features include four expansion slots, an Intel Corp. 8086 microprocessor with selectable clock speeds of 8 or 10 MHz and an IBM multiple Color Graphics Adapter interface.

The system is available in three configurations: a single 3½-in. floppy disk model priced at \$1,149, a dual 3½-in. floppy drive version priced at \$1,349 and a combination 20M-byte hard disk and 3½-in. floppy disk drive configuration priced at \$1,749.

Epson America
23530 Hawthorne Blvd.
Torrance, Calif. 90505
800-922-8911

Software applications packages

Hewlett-Packard Co. has released another version of its HP Graphics Gallery software for industry-standard personal computers.

Version 3.0 reportedly provides compatibility with the computer graphics metafile format. The software package consists of two components: the HP Charting Gallery for creating presentation-quality charts, and the HP Drawing Gallery for creating and editing text, illustrations and charts.

Each package is available separately or as part of the collection. Pricing ranges from \$249 to \$499 for first-time users.

and upgrades range from \$75 to \$125.
Hewlett-Packard
 3000 Hanover St.
 Palo Alto, Calif. 94304
 800-752-0900

A combination hardware and software product designed to produce electronic photography on personal computers is now available from Videotex Systems, Inc.

Video Publisher reportedly consists of a 512- by 512-pixel resolution digitizing board capable of capturing analog video at 256 gray levels. Images can be saved as encapsulated Postscript, TIFF or PCX files and imported directly into virtually any desktop publishing package, according to the vendor.

The product operates on IBM Personal Computers, PC XT's and ATs and compatible computers and is priced at \$995.

Videotex
 Suite 205
 8499 Greenville Ave.
 Dallas, Texas 75231
 214-343-4500

GW Instruments, Inc. has released Version 3.0 of Parameter Manager Plus, its data acquisition spreadsheet software for Apple Computer, Inc. Macintosh computers.

The software package was developed specifically for scientists to collect, analyze and display data, according to the company, and the enhanced version provides additional data-smoothing features and larger graph sizes—up to 400 by 400 in. The product can now handle as many as 32,767 graphs from a single data set and is priced at \$990.

GW Instruments
 35 Medford St.
 Somerville, Mass. 02143
 617-625-4096

A text editor for personal computers running MS-DOS or PC-DOS operating systems is available from Andrew M. Saucci Jr.

Called Decisive, the software is a single-screen text editor suitable for creating short memo notes and batch files, according to the vendor. Features include a nonlinking cursor and automatic word wrap functions. The product requires 256K bytes of memory and is priced at \$60 until April 1 and \$75 after that date.

Andrew M. Saucci Jr.
 727 Barkley Ave.
 E. Meadow, N.Y. 11554
 516-538-9209

Distribupro, the maker of Account by Design, has announced a price increase for its Client Write-Up software introduced last April.

The general ledger package for professional accountants originally carried a price of \$995. Version 2.0 of the product now costs \$1,295, according to the vendor.

Distribupro
 2034 Bearing Dr.
 San Jose, Calif. 95131
 408-436-7499

A C language programmer's tool kit has been introduced by Effective Data Solutions.

Zipwhere reportedly maintains a data file of U.S. ZIP codes and related geographic information, including city, state and county names and area code information. It requires less than 1M byte of storage and runs on IBM Personal Computers and compatibles.

Zipwhere costs \$139.
Effective Data Solutions
 Suite 102
 28225 Agoura Road
 Agoura Hills, Calif. 91301
 800-777-8816

Software utilities

A DOS driver that was designed to double the capacity of both hard and floppy disks has been introduced by Sundog Software Corp.

Called Squish Plus, the logical device driver is said by the company to be completely transparent and can compress files of up to 512M bytes.

The product runs on stand-alone IBM Personal Computers as well as compatible workstations and can operate with 3Com Corp. or IBM PC Network file servers.

Squish Plus costs \$99.95 and requires 36K bytes of random-access memory.
Sundog Software
 284 Court St.
 Brooklyn, N.Y. 11231
 718-855-9141



United Software Security's PC Librarian

United Software Security, Inc. has announced the release of an archiving utility for IBM Personal Computers, Personal System/2s and compatibles.

The program, which is called PC Librarian, is designed to remove inactive files from the PC while retaining a catalog of information pertaining to the removed files on the hard disk, the company said.

The software requires a minimum of 512K bytes of internal memory and is priced at \$99, according to the company.
United Software Security
 6133 Leesburg Pike
 Vienna, Va. 22180
 703-556-0007

A software package that allows personal computer users to program their computers to automatically perform routine tasks is now available from Complementary Solutions, Inc.

Called Automate, the product reportedly performs file backup, report printing and batch job scheduling automatically and according to a predetermined schedule. Operator intervention is not required. The software is priced from \$200 to \$250.
Complementary Solutions
 Suite 202
 4470 Chambliss-Dunwoody Road
 Atlanta, Ga. 30338
 404-454-6033

Microsoft Corp. is currently offering Docucomp, a document comparison program from Advanced Software, Inc., free of charge to Microsoft Word 4.0 users.

Docucomp uses pattern recognition technology to compare two versions of a document and report any changes, according to Advanced Software. It is available for other word processors in both networked and single-user versions and is priced at \$159.95 plus shipping and handling.
Advanced Software
 Suite 212
 1095 E. Duane Ave.
 Sunnyvale, Calif. 94086
 800-346-5392

Macintosh products

Xerox Imaging Systems has announced a text-scanning software package that provides intelligent character recognition (ICR) for Apple Computer, Inc. Macintosh-compatible scanners.

Datascop Accuview utilizes ICR technology to capture virtually any typeface in complex document structures, complete with word-processing commands, according to the vendor. It reportedly boosts the accuracy of desktop scanning systems available for the Macintosh II and the Macintosh SE with a Motorola, Inc. 68030 accelerator card.

The software requires 4M bytes of system memory and is priced at \$995.
XIS
 1215 Terra Bella Ave.
 Mountain View, Calif.
 94043
 415-965-7900

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Standard	4MB	4MB	4MB
System bus or optional local	4MB	4MB	4MB
System bus	4MB	4MB	4MB
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System expansion	Three system slots (slot 20, slot 21, slot 16-18)		
Operating systems	OS/2 1.1, A/E, Mac/OS, A/E, P/OS		



IBM.

ALWAYS

A voice-recognition system developed specifically for use with the Apple Computer, Inc. Macintosh has been announced by Articulate Systems, Inc.

Dubbed the Voice Navigator, the combination hardware and software product includes a built-in microphone, speaker and sound controls and responds to the user's voice in the same manner as a keyboard responds to touch, the vendor said. The system reportedly connects to the computer via the small computer systems interface port.

The Voice Navigator is set to ship in the second quarter and is priced at \$999. Articulate Systems
99 Erie St.
Cambridge, Mass. 02139
617-876-2236

A video card for the Apple Computer, Inc. Macintosh SE has been introduced by Mobius Technologies, Inc.

Called Multiscreen, the product reportedly allows users to attach a variety of full-size monitors to the Mac SE system. It consists of a video board and software for multiple resolution display and is priced at \$495.

Mobius Technologies
6020 Adeline St.
Oakland, Calif. 94608
415-654-0556

A 21-in. monitor developed for use with the Apple Computer, Inc. Macintosh II is now available from Monitor Corp.

The Viking 21 provides a square, flat screen designed to provide a larger display area and reduce glare pickup from overhead or peripheral light sources, the vendor said. The product displays 256 colors out of a palette of 16.8 million, weighs 78 pounds and costs \$3,795.

Minitem
5740 Green Circle Drive
Minnetonka, Minn. 55343
612-935-4151

Peripherals

In Focus Systems, Inc. has announced a line of PC Viewers designed to add high-contrast black-and-white projected images to the company's current blue and yellow display products.

The viewers reportedly allow presentations developed on a personal computer

to be magnified and displayed directly on an overhead projector, eliminating the need for traditional overhead foils.

Reportedly compatible with IBM Personal Computers and Personal System/2s as well as Apple Computer, Inc. Macintosh and Apple II machines, the PC Viewer line has a price ranging from \$895 to \$2,995.

In Focus Systems
7649 S.W. Mohawk St.
Tualatin, Ore. 97062
503-692-4968

An 8-bit, gray-scale, flatbed scanner has been introduced by Hewlett-Packard Co.

The HP Scanjet Plus is available with either an IBM Personal Computer or Apple Computer, Inc. Macintosh-compatible interface kit and provides 256 levels of gray, according to the vendor. An optional 20-page sheet feeder is available. The scanner costs \$2,190.

HP
3000 Hanover St.
Palo Alto, Calif. 94304
800-752-0900

Pacific Data Products has announced a Hewlett-Packard Co.-Graphics Language (HP-GL) emulation cartridge for laser printers.

According to the company, the product offers a complete emulation of HP's 7475A plotter and implements HP-GL on an HP Laserjet Series II printer. The cartridge reportedly provides print-spooling capacity to 2M bytes and is priced at \$395.

Pacific Data
6404 Nancy Ridge Road
San Diego, Calif. 92121
619-552-0680

Board-level devices

A scanner and laser-printer controller has been introduced by Advanced Vision Research, Inc.

The Tiger-EMS board was designed for office publishing applications, the company said, and runs on Intel Corp. 80386-based machines as well as IBM Personal Computer, PC XT and AT and compatible systems.

The board comes with 2M bytes of random-access memory, expandable to 8M bytes, with a daughterboard option. The single-slot card includes memory-management software and supports several hardware platforms.

The interface board, with 2M bytes of RAM and software, is priced at \$1,795. Advanced Vision Research
2201 Quam Drive
San Jose, Calif. 95131
408-434-1115

Capital Equipment Corp. has introduced a multifunction board designed for use with IBM's Micro Channel Architecture.

The OS/RAM6 provides up to 8M bytes of memory and two serial ports and automatically configures itself for DOS or OS/2, the vendor said. Micro Channel installation can reportedly be accomplished with four keystrokes, and no configuration changes are required when changing operating systems.

The board is priced at \$449 and includes a two-year warranty on parts and labor.

Capital Equipment
No. 107, 99 S. Bedford St.
Burlington, Mass. 01803
617-273-1818

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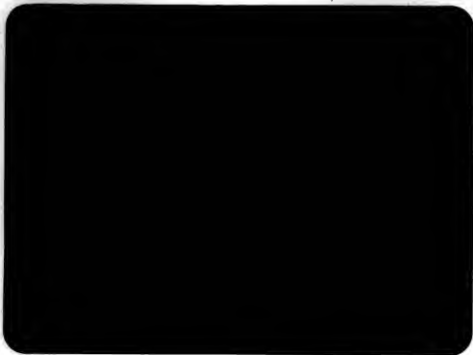
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NETWORKING

DATA STREAM

Thomas L. Nolle

Life beyond AT&T



Second of a two-part series. Last week's column introduced independent "regional" carriers that are extending their geographic reach to challenge dominant interexchange carriers with lower prices and advanced service offerings. However, the reality of dealing with such companies introduces some potential snags.

Network management is one potential trouble area — particularly as regional carriers band together in consortiums. Once they have linked their respective networks, the problem of finger-pointing rears its head.

However, carrier management techniques are strong enough to allow most users to employ any major regional carrier without significant risk.

For example, National Telecommunications Network, a consortium of five regional carriers, maintains a separate network operations center from which it can oversee the high-level trunk activity in a multi-region network. If a problem is identified, the group's center

Continued on page 57

Tariff 12 considered

AT&T's custom net service not for everyone

BY MITCH BETTS
OF STAFF

WASHINGTON, D.C. — AT&T's Tariff 12 custom network service provides network managers with a host of new opportunities, but it can also leave them with new decisions to make about how much control they want over their corporate networks.

For example, Tariff 12 contracts put responsibility for network equipment, maintenance, repair and technology upgrades in the hands of AT&T, according to speakers at the Communications '89 conference earlier this month.

Berge Ayvazian, vice-president of Boston-based research

and consulting firm The Yankee Group, said this means managers can reduce in-house staff and count on automatic upgrades, but it also means a loss of control when something breaks down.

Trade-off

In addition, the volume discounts in Tariff 12 contracts discourage users from splitting their network traffic between two long-haul carriers. The trade-off for the low price is the vulnerability of depending on a single carrier, Ayvazian said.

Tariff 12 is a regulatory umbrella that covers custom-network contracts negotiated with individual customers such as Du Pont Co. and Ford Motor Co. The contracts provide a package

AT&T signs corporate elite

Some of the largest U.S. companies are building custom AT&T networks under Tariff 12

Customer	Contract	Effective date
Defense Department	Defense Commercial Telecommunications Network	Oct. 1, 1985
General Electric	Digital Trunk Switched Network	Aug. 20, 1987
Du Pont	VTNS* Option I	Feb. 10, 1988
Ford	VTNS* Option II	April 29, 1988
American Express	VTNS Option III	Oct. 31, 1988
American Airlines	VTNS Option IV	Jan. 30, 1989

* Virtual Telecommunications Network Service

SOURCE: THE YANKEE GROUP
OF STAFF, JERRY TURE

of voice and data transmission, network management and associated equipment and services.

The contracts allow customers to pay for tariffed network services rather than purchasing equipment, thus complementing AT&T's effort to migrate net-

work switching and management from customer premises back onto the AT&T network, Ayvazian explained.

"This strategy also addresses the growing interest of telecommunications users in leasing

Continued on page 55

E-mail services bow to X.400 pressure

BY ROBERT MORAN
OF STAFF

As users increasingly demand common links between different electronic mail systems, communications service companies are moving — however reluctantly — to support the CCITT X.400 standard.

Already widely adopted in Europe, the X.400 protocol is finally catching on in the U.S.

Large corporations and the U.S. government want to link their private E-mail systems to public systems, spawning a call for a national E-mail network. Major vendors have already provided X.400 support on the private side, now it is up to vendors such as

Telecom Communications Corp. and Western Union Corp. to provide X.400 support to their public E-mail services.

Large customers want one

system that can connect them to members within their organizations but also to their suppliers and customers. According to Richard Miller, president of Rapoport Communications, Inc. in Palo Alto, Calif., large business users are turning to X.400 because it can bear much more than the interpersonnel messages typically found on E-mail systems.

One of the business applications for X.400 is to work as a complement to electronic data interchange (EDI). The growing throng of businesses that use EDI to exchange documents electronically with business partners are increasingly de-

manding X.400 as a standardized E-mail system to deliver such documents. Standards bodies are already working on ways to integrate EDI with X.400.

In addition to the nudge from large corporations, two powerful bodies have used their might to bring the services companies close to X.400. The American Industry Association (AIA) challenged vendors that tout X.400 last December to provide interconnection or lose their business. The association, Miller said, wants to subscribe to one vendor and communicate with the party of its choice, which may be using a different E-mail

Continued on page 57

Studies help uncover ISDN markets

BY ELISABETH HORWITT
OF STAFF

MORRISTOWN, N.J. — For the last two years, AT&T has conducted a series of Trivista studies to determine how ISDN and other enhanced services can meet the communications needs of customers in various industry segments.

The 20 detailed studies conducted so far have generated integrated Services Digital Network customers for AT&T and the former Bell operating companies in almost every case, according to AT&T Network Systems Division spokesman Michael Vogel. The results, packaged into marketing pamphlets, have become part of AT&T's campaign to convince prospective users that "ISDN is here now." But they also offer clear map-

shots of how different types of organizations are gaining real cost and productivity benefits from the technology.

Trivista is a three-way partnership, consisting of AT&T's Network Systems subsidiary, "which knows the technology and products," local telephone companies, "which provide the services," and end users, "who know day-to-day business needs and can help us understand how to customize" the network to meet them, Vogel said.

The team inventories the customer's networking installation and then conducts a study that "envisions what the introduction of ISDN would mean in terms of productivity and cost," Network Systems' spokeswoman Ellen Bond said.

Market segments covered so far include insurance, health

care, manufacturing, banking, education, hotels and motels and government.

The first study subject — Tenneco, Inc. — has become a full ISDN user, with approximately 3,000 lines on Southwestern Bell Corp.'s ISDN Centrex service (CW, Jan. '90). Among the other study subjects, which did not want their names disclosed, were the following:

- An insurance company developed the idea to install ISDN links to provide independent agents with the ability to access the latest product information over ordinary telephone lines. The application is designed to help the company gain a firmer hold on its better agents and make sure all agents are up-to-date and well trained, Vogel said.
- A hospital concluded that AT&T network would be useful for elimi-

nating the expense of modems, incompatible local-area networks and private lines as a way to connect different departments in a city complex. The hospital is also considering implementing its own version of the insurance company application described above, which it learned about from AT&T. Doctors who use the hospital as a consulting hospital would use into the organization's data and applications via ISDN lines.

• A hotel chain is looking at an application that would let customers check in at the airport but still have eye-to-eye contact with the hotel clerk through a compressed video signal sent over a 64K bit/sec. ISDN link.

Originally, Trivista aimed at finding applications for a variety of enhanced features and services that could be made available on the central office equipment that AT&T Network Systems sells, Vogel said.

"A lot of the enhanced service capabilities that ISDN brings will reside in the public network, in the central office. But there are also pre-ISDN enhanced services that provide customers with more control of the Centrex offering. It's rather difficult to get customers to upgrade a basic Centrex service to the tune of 20% to 50% (cost increase) unless you can truly see some value that's very direct," he said.

The initial idea was not to generate requests for proposals but simply to "document on an industry-by-industry basis what critical needs can be best or uniquely addressed by the services and to quantify those benefits to the end user and telephone company," Vogel said. The studies have "put into black-and-white what it costs a telco to implement ISDN for a specific user and how that might translate into a tariff," he said.

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—Joe Frizzell, Manager
AT&T Data Maintenance Operation and Control Center
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service you couldn't buy from another vendor at any price. Because only AT&T offers it.

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To find out how much more you get with AT&T DATAPHONE II data communications equipment, see your AT&T Account Executive, your authorized AT&T Reseller, or call 1 800 247-1212, ext. 717.



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BIT BLAST

Banks' role in EDI disputed

Attendees at the recently held EDI and Financial Institutions Symposium debated the role banks should play in providing electronic data interchange (EDI) services. While many attendees said they are counting on the banks to provide these services, spokesmen from Procter & Gamble Co. and General Electric Co. stated that major corporations will deal directly with one another for most EDI transactions, turning to banks only for EDI payment services.

In response to AT&T's recent 3.8% rate decrease, Vienna, Va.-based Cable & Wireless Communications, Inc. said it has also reduced rates for its long-distance and call accounting services and completed a major restructuring of its equal-access WATS service. Rates for interstate switched and dedicated access services have dropped an average of 5%. Fees for its call accounting and security features were reduced an average of 28%. The restructured WATS service reportedly will provide 5% savings.

Data General Corp. has joined the OSI/Network Management Forum, a vendor organization dedicated to ensuring interoperability of different vendors' network management products through the use of Open Systems Interconnect protocols.

National Advanced Systems, Inc. (NAS) extended its scientific/engineering strategy recently by announcing an IBM-to-Digital Equipment Corp. VAX connectivity link. NAS, which often installs IBM-compatible machines at DEC sites, has agreed to co-market a high-speed network controller product made by Interlink Computer Systems, Inc.

An electronic mail system for the bearing industry has been co-developed by Gallaudet College and Metrosat. It is said to send full-text messages either by Telecommunications Device for the Deaf or ordinary telephone to a portable pocket-size receiver that vibrates to alert the recipient that a message is waiting.

Cayman National Bank and Trust Co., the only locally owned bank in worldwide financial center the Cayman Islands, has implemented a signature scanning, storage and display system using a hand scanner from Cameron GMBH in West Germany and a customized mouse-driven software program that runs on three NCR Corp. microcomputers compatible with the IBM Personal Computer XT. The personal computers use NCR's TowerNet to access digitized signatures stored in an NCR Tower 600 hard disk.

IBM Information Network, which had served the U.S., Canada and Europe, will now provide E-mail and EDI services between the U.S. and Japan via IBM Systems Network Architecture links.

Four companies have successfully completed protocol verification procedures to integrate their applications with Integrated Business Exchange, a private branch exchange system from Wang Laboratories, Inc. subsidiary Intecom, Inc. The vendors are Amcom Software, Inc., Comco, Inc., Digital Techniques, Inc. and Startel Corp.

As part of a recently launched campaign to modernize and rewire its telecommunications network, China is installing AT&T 5ESS digital switches in many major cities. One of the 5ESS switches, handling 12,160 lines, was installed to handle data and voice communications for the Ministry of Railways in Beijing.

The Canadian Imperial Bank of Commerce in Toronto will become the first commercial user of Bityx Corp.'s Unity system, which is said to provide local- and wide-area switching and network management capabilities. The \$1 million-plus contract calls for two Unity 50 systems to be installed in two of the bank's data centers, Bityx said.

American Airlines is the most recent company to sign up with AT&T under a Tariff 12 contract, effective Jan. 30. As in previous Tariff 12 contracts, the customer will pay a flat monthly fee and measured charges based on rate periods and mileages. The contract will last for five years and will offer a 10% discount during any month in which usage charges in certain locations exceed \$30,000.

Tariff 12

CONTINUED FROM PAGE 51

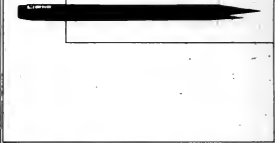
rather than owning their entire network," he said.

"Tariff 12 provides the customer with the conveniences of one-stop shopping, a single point of responsibility and an end-to-end solution," he continued. Moreover, Tariff 12 users tend to get new features such as bandwidth management systems before they are widely available, he said.

AT&T's goal, Ayanian said, is to create a close partnership with the top 200 national accounts and gain a competitive advantage in its head-to-head competition with MCI Communications Corp. and U.S. Sprint Communications Co.

Of course, MCI and U.S. Sprint are not sitting still. MCI recently signed contracts for custom-designed private networks with United Airlines, Procter & Gamble Co. and Day & Bradstreet Corp., while U.S. Sprint has new contracts with Westinghouse Electric Corp., North American Phillips and the U.S. General Services Administration.

Bob,



Simpact Associates, Inc. and Systems Strategies, Inc. (SSD) have announced a marketing and distribution agreement to develop and market a turnkey DEC-to-IBM system that combines SSI's VAX Link/SNA software family with Simpact's hardware platform. The product reportedly will support 3270,

RJE and, eventually, LU6.2-based links between DEC and IBM hosts.

Contel ASC has boosted its capacity to provide very small-aperture terminal satellite services by installing a fourth shared hub at the New York Teleport in Staten Island, N.Y.

David Nail, a Washington, D.C., attorney, said that network managers should be wary of several pitfalls with Tariff 12 contracts:

- You lose control over your private network because AT&T determines what facilities will be used.
- Managers of data networks may find themselves "playing second fiddle to the voice people" in cases in which voice traf-

fic makes up 90% of the network volume and thus generates most of the price discounts.

- The contracts lock customers into AT&T service for three to five years.
- "and you're going to have some heavy liability if you try to get out of that too quickly."

Customers also should be aware of the regulatory uncertainty surrounding the controversial Tariff 12, which the Federal Communications Commission allowed to take effect pending an investigation. It is not clear what will happen to existing networks if the FCC, or a court, rules Tariff 12 unlawful.

The FCC is currently investigating charges by MCI, U.S. Sprint and others that Tariff 12 is illegal because the custom networks do not qualify as generally available common-carrier services and the special discounts could amount to predatory pricing.

John R. Hoffman, senior vice-president at U.S. Sprint, said he is concerned that "as more time passes, it is going to become more difficult to unscramble the egg if Tariff 12 is ultimately found to be unlawful."

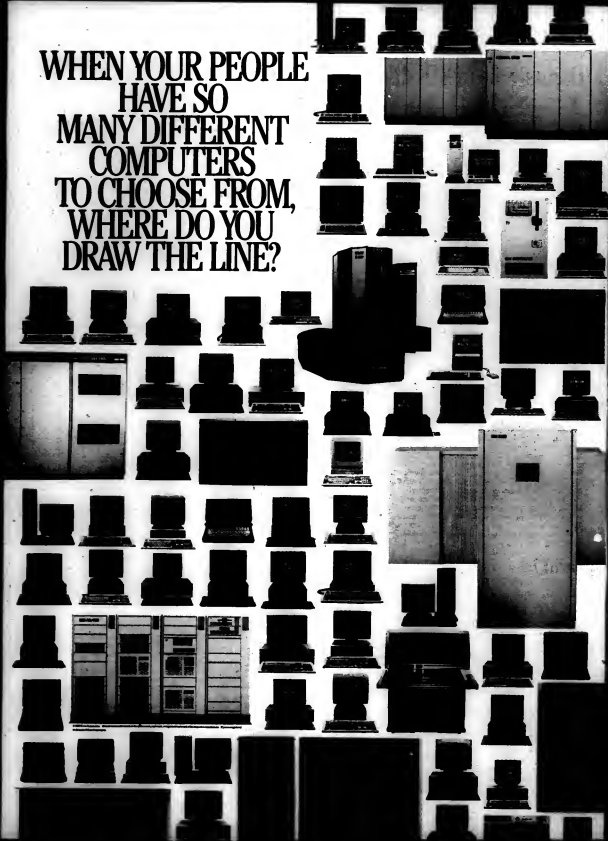
Legal questions

Should companies be allowed to use Tariff 12 contracts? Or should they be required to use the standard Tariff 12 based on the FCC's rules?

- Is Tariff 12 a form of predatory pricing? Is it a form of price discrimination? Is it a form of price fixing?
- Is Tariff 12 a form of price discrimination? Is it a form of price fixing?
- Can the "one-stop" service be used?
- Are AT&T's Tariff 12 contracts unilaterally beneficial?

NETWORKING

WHEN YOUR PEOPLE
HAVE SO
MANY DIFFERENT
COMPUTERS
TO CHOOSE FROM,
WHERE DO YOU
DRAW THE LINE?



Nolle

CONTINUED FROM PAGE 51

hands it off to a regional center, whose own network management system can usually test circuits through the local exchange right to the customer's interface.

This is not to say that regional service is for everyone. Most of the regional carriers have purchased fiber right-of-way and tend to locate their switching and connection points—points of presence, or POPs—along their routes. Thus, while an Amarillo, Texas, data center manager may be able to lease digital service from a regional carrier easily, someone in Pierre, S.D., may have no regional carrier at all.

Even where there is a POP in the area, the user may find that the distance between the regional POP and the target termination for the service is so great that local access charges exceed the long-haul cost.

Like all telephone circuits, a regional-based circuit has several cost components. The interexchange charge set by the regional carrier moves the information between the POPs closest to the subscriber's endpoints. Local exchange costs are assessed to link that endpoint to the carrier POP. Both these costs typically include a one-time installation charge and a monthly recurring charge. Carriers may also bill for service coordination if they want the regional carrier to set up the local access line for them.

It is important to understand the charge basis when dealing with a regional carrier, but it is also important to understand the difference between these carriers and some of the larger and more regulated interexchange carriers.

AT&T, MCI and Sprint all have pub-

lished tariffs for interexchange service. Other carriers such as ITT also file government tariffs, available from the Federal Communications Commission and the carrier, that provide not only service rates and other charges but will also indicate discount schedules and terms. Regional carriers are rarely required to file formal rate schedules and thus rarely have them available for review.

Getting a copy of an interexchange carrier tariff helps set a baseline against which regional rates can be measured. Pricing varies widely with the duration of the contract and the total dollar volume of business or circuit miles involved. A cross-country T1 route may be priced at more than \$40,000 per month on a month-to-month basis from one carrier and at \$24,000 per month on a one-year term from another.

Quality is always a concern of network users and particularly so when "name-brand" carriers are not used. Most regional carriers will guarantee error performance at levels similar to and sometimes better than the large interexchange carriers. Many have all-fiber networks or are exclusively fiber on most major city-pair connections, so they are not fearful about writing quality commitments and service credit terms into an agreement.

For users lucky enough to be located near a regional carrier's POP, the service and cost benefits may be very significant. Major firms have reported savings of 40% over the best terms negotiable from the major carriers. In these times of financial pressure, a regional carrier can often mend a broken budget.

Nolle is president of CMI Corp., a communications consulting company based in Haddonfield, N.J.

E-mail services

CONTINUED FROM PAGE 51

service vendor.

Adding more force is the Government Open Systems Interconnect Profile, or GOSIP, a federal information processing standard established last August that mandates that governmental agencies procuring data communications services adhere to the International Standards Organization's Open System Interconnect, which includes X.400 messaging.

Until now, most analysts contended, service vendors have responded to customer demand for X.400 by providing X.400 gateways to computer-based e-mail systems and promising to connect to competitors later.

"The service vendors have been playing a waiting game as far as providing X.400," Miller added.

But this appears to be changing. Telexnet, AT&T, MCI Communications Corp., Diconco, Inc., GE Information Systems, GTE Communication Systems, McDonnell Douglas Corp. and Western Union Corp. made commitments to participate in the AIA pilot project. IBM Information Network, which is preparing to offer service interconnection, has yet to commit to the pilot. Western Union has committed to an X.400 interconnection with GE Quickcom and McDonnell Douglas Outspan, but the company does not offer X.400 services.

According to Marni Erlich, district manager of electronic messaging systems

and office automation at AT&T, the company is testing an X.400 connection between AT&T Mail and an undisclosed service in addition to its connection with Diconco, announced in January. Western Union, according to Vice-President of Marketing Brian Gaylord, has been testing X.400 with a few U.S. customers and European administrations. Telexnet also has set up international X.400 connections, a company spokeswoman said.

Sign of life

One sign of the healthy demand for X.400 is the fact that many vendors are working on the next generation of X.400 gateways, at least partly because the current products cannot efficiently handle growing traffic demands, Miller said.

However, both national and international X.400 networks are still missing one critical element for success: directories. From electronic analogs to the telephone company's white pages, directory services would allow users on different vendors' e-mail services to exchange mail automatically—without first having to call a recipient to find out his or her mailbox address, log-on name and so on.

But directories currently do not offer the necessary universal accessibility, which will be provided by the latest version of the X.400 specification standard. Now that X.400 specifications are in place, vendors are expected to move more quickly from the 1984 version of X.500 to the 1988 version.

According to Miller, the vendors plan to offer X.500 directories in conjunction

with their next X.400 offerings. Telexnet said it plans to announce an X.500 directory in the fourth quarter.

Another thorny issue that has bogged down X.400 service introductions is allocation of charges when two or more e-mail services are involved in a user exchange. Service vendors have been meeting with European communications carriers and value-added network suppliers in the International ADMOD operators group to establish what may be measured and what is chargeable.

sured and what is chargeable.

According to Miller, service providers already interconnected have brought their experience and influence to play at the committees. Walter Ulrich, a partner at Coopers & Lybrand's Management Consulting Services Division, added that corporations are already conditioned to paying premiums for telecommunications links that involve more than one carrier and will likely look to telephone charges as a model.

X.400 group coalesces

A group of computer and communications vendors has formally launched the X.400 Application Program Interface Association (APIA) with the goal of developing application program interfaces for the CCITT X.400 messaging standard.

Interfaces are designed to allow personal computer applications on networks to access X.400 services. "Our goal is to encourage the integration of LAN applications with wide-area services," said Stephen Lane, director of PC Services at Telexnet Communications Corp. "With X.400, we hope to provide all users within an organization peer-level access to each other, regardless of their operation platform."

The group, which seeks to ensure interoperability among different vendors' implementations of X.400-based products, actually kicked off last year with a series of informal and organizational meetings.

X.400 is the first global e-mail standard that provides true OSI interoperability between systems and software from a variety of vendors, according to the APIA.

The standard is supported worldwide by vendors and users, many of whom consider the standard key to nonproprietary data exchange-related external communications with business partners and far-flung internal sites.

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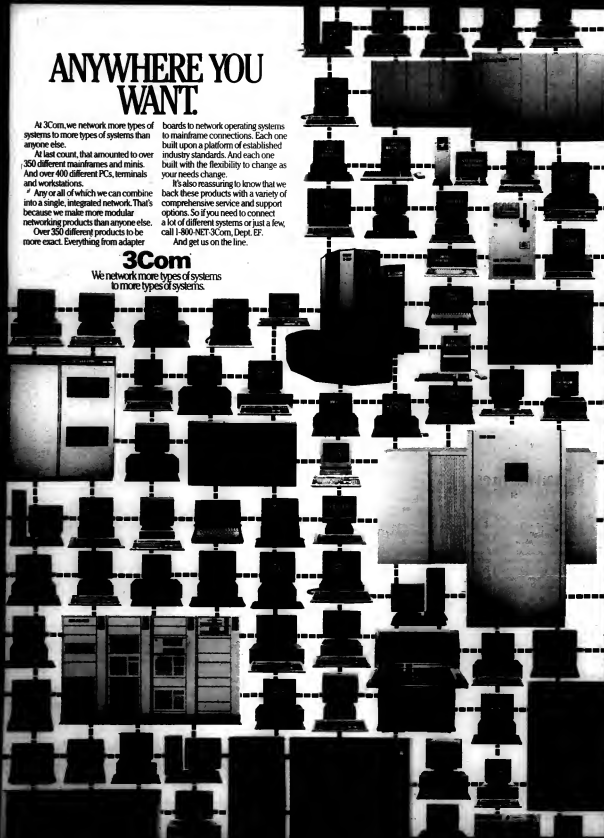
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NEW PRODUCTS

Local-area networking hardware

Cisco Systems, Inc. has introduced a four-member family of internetwork routers and terminal servers designed to provide connections to Token-Ring (IEEE 802.5) local-area networks.

The product line reportedly includes a Token-Ring terminal server that supports up to 95 devices, a Token-Ring-to-Ethernet (IEEE 802.3) router, a Token-Ring-to-Token-Ring router and a Token-Ring-to-wide-area network router that uses synchronous serial lines.

The four products are based on the company's Token-Ring Interface card, which provides a connection to Token-Ring networks running at speeds up to 4Mbit/sec.

Pricing ranges from \$11,900 to \$20,800, depending on configuration. Upgrade kits are available for current users.

Cisco Systems
1350 Willow Road
Menlo Park, Calif. 94025
415-326-1941

Digital Products, Inc. has introduced an unattended tape backup facility for use with the company's NetCommander sub-local-area network series.

Called Sublan Backup, the unit is designed to automatically protect data on departmental personal computer hard disks, including the hard disks of individ-



Digital Products' Sublan Backup

ual personal computers connected to local-area networks.

The product is available as a Sublan option and ranges in price from \$3,495 to \$3,995.

Digital Products
108 Water St.
Watertown, Mass. 02172
800-243-2333

Jupiter Technology, Inc. has introduced the System 100, a line of data communications computers the company said is intended for use at remote sites of large networks.

The systems can be used as a local-area network server or a multiaccess terminal cluster controller, and all of the systems utilize a proprietary communications operating system, the vendor said.

The System 100 is capable of serving from four to 384 lines and is priced from \$8,500.

Jupiter Technology
78 4th Ave.
Waltham, Mass. 02154
617-890-4555

Network management

Micom Communications Corp. has announced the X.25 Network Management System (XNMS).

The product is based on an IBM Personal Computer AT/Intel Corp. 80386 platform and is said to provide a graphics monitor, centralized configuration, event management and call accounting capabilities. The Xenix-based XNMS software program reportedly allows multitask processing on the AT, and file conversion is included for importing billing and statistics files to Lotus Development Corp.'s 1-2-3 spreadsheet.

The XNMS package, including software, the Xenix operating system and an Eicon Technology Corp. X.25 Communications Card and software, is priced at \$15,000, with deliveries scheduled to begin this month. The 386 PC AT is purchased separately.

Micom
4100 Los Angeles Ave.
Simi Valley, Calif. 93063
805-583-8600

BBN Communications Corp. has announced the migration of its Network Access System (NAS) from Digital Equipment Corp.'s Microvax II to a Microvax 2000 platform.

NAS was designed to protect sensitive information and system resources on BBN wide-area networks from unauthorized access. The system is composed of a centralized Master Database host and one or more distributed Access Control Server hosts, the vendor said.

Pricing starts at \$125,000 for a minimum configuration, which includes two Microvax 2000 computer systems.

BBN
150 Cambridge Park Drive
Cambridge, Mass. 02140
617-873-2693

Hewlett-Packard Co. has announced the release of several enhancements to the HP 4954A wide-area network protocol analyzer.

The product has been upgraded to include the following: the HP 4954i analysis and analysis software for Integrated Services Digital Network, priced at \$20,500; the HP 18320A language environment for C programming, priced at \$2,000; and the HP 18321A package for emulating X.25 Levels 2 and 3, also priced at \$2,000.

Hewlett-Packard
3000 Hanover St.
Palo Alto, Calif. 94304
800-752-0900

Emerald Systems Corp. has introduced a local-area network data management system for use with Novell, Inc.'s Advanced Netware.

Called EMQ, the system provides shared tape backup services and allows network supervisors to manage offline data storage systems.

Emerald Systems' Tape Backup Server system, which includes both EMQ and the VAST Device, is priced at \$8,490, the company said.

Emerald
4757 Morena Blvd.
San Diego, Calif. 92117
619-270-1994

And in the rest of the company



Links

Canon U.S.A. has expanded its family of personal facsimiles with the introduction of the Faxphone 15.

The desktop communications device reportedly incorporates both facsimile and telephone features into a single compact, lightweight design. According to the company, the unit transfers information at 9.6K bit/sec. and includes an automatic five-page document feeder, fine mode,



Canon's Faxphone

automatic background control and automatic reception capabilities.

The Faxphone 15 costs \$1,695.

Canon
One Canon Plaza
Lake Success, N.Y. 11042
516-468-6700

A remote communications processor that accesses incompatible databases simultaneously has been announced by Commec-

tics. The stand-alone Commec CN-2000 reportedly features Custom Application Mapping software that lets terminal users enter one request, which is automatically reformatted to access incompatible databases residing on up to six host mainframes.

The unit utilizes a Motorola, Inc. 68000 processor and operates under Unix, the company said.

The CN-2000 is priced from \$150,000 for a 48-user system.

Commec
390 University Ave.
Westwood, Mass. 02090
617-326-1221

A software product that transfers data and integrates operations among Tandem Computers, Inc. computers and IBM mainframes has been announced by The Systems Center, Inc.

Network Dataover-Tandem (NDN-Tandem) enables Tandem computers running the Guardian operating system to communicate with mainframes running NDM-MVS, NDM-VM and other NDM products.

The package has file transfer, automated operation, management control and security functions, according to the company.

Pricing ranges from \$2,000 to \$30,000, depending on processor site.

The Systems Center
Suite 101
2477 Gateway Drive
Irving, Texas 75063
800-292-0104

An optically isolated RS-232 to RS-422 plug-in adapter has been introduced by Computer Dynamics, Inc.

According to the vendor, Opto-Adapt can connect RS-232 and RS-422 interface circuits bidirectionally at distances longer than 5,000 ft. The adapter can be used for long-haul communications between buildings and has a price tag of \$120.

The external power supply, which is not included, is available for \$10.

Computer Dynamics
107 S. Main St.
Spartanburg, S.C. 29581
803-677-8700

A PC-to-PC telecommunications program for file transfer applications has been announced by Eidolon Technologies.

Called Quicktran II, the product reportedly uses compression and decompression technology for file transmission and can be used to set up an unattended electronic mailbox. An IBM Personal Computer, Personal System/2 or compatible system with a Hayes Microcomputer Products, Inc.-compatible modem is required.

Quicktran II costs \$39.95. An

individual copy is needed for each end of a file transfer.

Eidolon
P.O. Box 20680
Columbus Circle Station
New York, N.Y. 10023
212-795-7909

Dresselhaus Computer Products has announced that it is shipping its latest version of Smartprint, a laser sharing system for IBM,

Apple Computer, Inc., Digital Equipment Corp. and other computers.

Smartprint/LSS is reportedly capable of connecting multiple processors to any laser printer. It is available in either four- or six-port versions, which are priced at \$179 and \$199, respectively.

Both versions of the product are offered in parallel or serial configurations.

Dresselhaus
Suite 405
8560 Vineyard Ave.
Rancho Cucamonga, Calif.
91730
800-368-7737

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The MultiModemV32 gives you 9600 bps full duplex operation with 4800 bps fallback, over both dial-up and leased lines, just like a CCITT V.32 compatible modem should.

However, the most remarkable thing about the MultiModemV32 is its ability to perform automatic speed detection and switching between 9600, 4800, 2400, 1200 and 300 bps. This allows the modem to automatically match on-line speeds with other V.32, V.22bis and 212A compatible modems.

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Dresselhaus' Smartprint

Cabletron Systems, Inc. has added two low-cost bridges to its family of Ethernet products and services.

The NB20E and NB25E series of two-port intelligent bridges were designed to provide high-performance connectivity between Ethernet and 802.3 local-area networks of various media, the vendor said. The products reportedly allow users to connect two or more Ethernet segments to create extended-distance LANs and increase bandwidth efficiency.

The bridges operate at the data link level of the Open Systems Interconnect model and are protocol-independent. The NB20E costs \$2,995, and the NB25E is priced at \$5,495.

Cabletron
10 Main St.
Rochester, N.H. 03867
603-332-8400

OSI-Danet, Inc. has announced a family of Unix-based Open Systems Interconnect (OSI) development products designed specifically for software development personnel.

The OSI Product Development Support System reportedly will guide designers through the development process, analyze the behavior of OSI software and test for OSI conformity before modules are integrated into the final product.

The products can be used with a variety of hardware systems and are priced from \$32,000. **OSI-Danet**
Suite 300
1850 Centennial Park Drive
Reston, Va. 22091
703-758-0077

A line-sharing device aimed at the computer, facsimile and telephone markets is now available from Lynx Automation, Inc.

Called Extraline, the product was reportedly designed to make one telephone line perform the work of two. It includes a microprocessor that automatically directs calls to a choice of devices and can operate in unattended mode, the vendor said.

Extraline costs \$299.
Lynx
P.O. Box 99068
Seattle, Wash. 98199
206-285-1754

Protocol converters

A protocol converter that connects the IBM 3262 printer with IBM's Application System/400 midrange computer has been announced by Black Box Corp.

The PQ-3262 is designed to allow the printer to attach directly to the host's twin-axial cable and will not degrade printer speed or other features, according to the vendor.



Black Box's PQ-3262

ing to the vendor.

The converter also facilitates connection between the 3262 and the IBM System/36 Models 5362, 5363 and 5364. It is priced at \$2,990.

Black Box
Box 12800
Mayview Road at Park Drive
Pittsburgh, Pa. 15241
412-746-5500

Modems/Multiplexers

Case/Datatel, Inc. has introduced three Bell-compatible modems.

The Rizon 4212 dual-speed, full-duplex modem for direct-distance-dialing switched networks reportedly operates at speeds up to 1,200 bit/sec. The Rizon 4202 asynchronous modem operates at speeds up to 1,800 bit/sec. Both devices are priced from \$469 to \$489.

The Rizon 4200 829 frequency unit was developed for standard termination in four-wire loaded or unloaded private line, 3000-type voice-grade data channels. It is priced from \$299

to \$329.

All are available in desktop and rack-mount versions.

Case/Datatel
55 Carnegie Plaza
Cherry Hill, N.J. 08003
800-424-4451

Codex Corp. has introduced two CCITT V.32 modems, the 2264 and the 2266.

The 2264 is available in a

stand-alone or nestable rack-mount version and supports operating speeds from 1,200 to 9.6K bit/sec. In asynchronous or synchronous modes over two-wire dial or two-wire or four-wire leased lines, according to the company. It is priced at \$1,695.

The 2266 is the international version of the 2264 and is priced at \$1,900.

Codex
Marefield Farm
7 Blue Hill River Road
Canton, Mass. 02021
617-364-2000

E-Tech Research, Inc. has introduced a CCITT V.32-compatible, 9.6K bit/sec., full-duplex modem.

The EP9696 is said to be capable of communicating with mo-

dem ranging from 9.6K bit/sec. to 75K bit/sec. on either full-duplex or half-duplex modes and synchronous or asynchronous modes over dial-up or leased lines. It is priced at \$1,695 with a two-year warranty.

E-Tech
No. 275
2700 Augustine Drive
Santa Clara, Calif. 95054
408-982-0270

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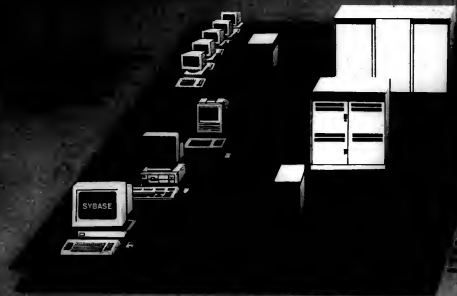
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Emeryville, CA 94608

RELATIONAL DBMS

RDBMS show they can pull OLTP weight

BY ALAN RADDING

For years, relational database management systems have been regarded with suspicion in terms of their ability to handle on-line transaction processing (OLTP) applications. Recently, however, improvements in relational DBMS products and some changes in thinking about what cost-effective transaction processing is really all about have combined to produce more application opportunities for RDBMSs at this level.

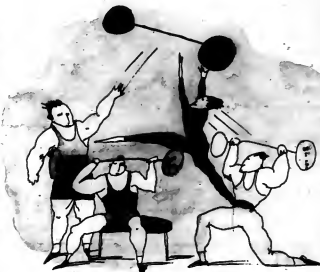
For example, at Capital Market Technology, Inc. (CMT), a Berkeley, Calif.-based foreign currency trading firm, a Sybase, Inc. RDBMS running on a Sun Microsystems, Inc. workstation is used for 24-hour on-line updating of currency prices. According to Brian Chapman, computer operations manager, the system supports about 20 concurrent users and a transaction volume that averages around 15,000 per day. CMT shuffles its client money from one currency to another to take advantage of minute-by-minute market fluctuations. Chapman says, and the Sybase RDBMS is a critical cog in that process.

Currency trading represents a specialized niche within the financial services industry, and CMT is typical of the users who are taking a chance on the combination of relational technology and OLTP.

On-line transaction processing is a broad concept but is generally understood to involve the running of mission-critical production applications in a real-time environment. Conventional OLTP applications involve very high volumes of generally simple, straightforward tasks, such as debit/credit transactions.

The classic OLTP systems—airline reservations and bank

Radding is a Boston-based free-lance writer.



BLAKE/WHOLEY

automated teller networks—predate relational technology. "Nobody would dream of trying to rewrite one of those major existing programs," observed Kenneth Bosworth, president of the market research firm International Resource Development, Inc. in New Canaan, Conn.

The real growth potential for RDBMS in OLTP, Bosworth says, is in applications written for smaller niches within the traditional heavy-OLTP industries or in areas, such as factory automation, that lie outside the usual domain of OLTP.

OLTP in the factory is not very different from OLTP in an environment like banking, says Eric F. Palmer, president of The Palmer Group in Atlanta. True, the input comes from a factory floor device reporting an operation instead of from a teller taking a deposit, but the require-

ments on the system are virtually identical, he maintains. "OLTP in integrated manufacturing just means you are getting a stream of input from a lot of devices instead of people," Palmer points out.

Palmer, a database specialist, recently served as systems integrator on a state-of-the-art factory automation project for a Northeast defense systems contractor that incorporated Relational Technology, Inc.'s Ingres RDBMS.

According to Palmer, Ingres 5.0 is performing just fine on the project, even though the factory runs as many as 140 concurrent users and handles up to one million multitasking transactions each day. Response time is generally calculated in microseconds, he says, although a few transactions may take as long as 10 seconds. "We modeled the frequency of transactions and optimized

for the ones that run thousands of times rather than the handful that run just a couple of times," Palmer adds.

One of the things that is happening, suggests George Schussel, president of Digital Consulting, Inc. in Andover, Mass., is that although most RDBMSs still cannot compete with hierarchical products on the basis of pure speed, many organizations are coming to feel that speed of throughput is not the only consideration and transactions per second is not the only yardstick when it comes to transaction processing.

"Most businesses don't care about transactions per second," Schussel maintains. "What really is important is transactions per dollar, and this is where an RDBMS can really beat a hierarchical system. The RDBMS may not be faster, but it will be cheaper."

The savings, Schussel and others say, come from flexibility that the relational model provides. A relational database is a database in which the logical data is organized simply as tables without the pointers or structural elements of a hierarchical database and independent of the physical data. Using keys and indexes, an RDBMS automatically navigates through the database

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Myths and realities about relational technology. Page 76.

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OLTP

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with the assistance of an optimizer.

The separation of the logical data from the physical structure of the database allows you to create the database without first having to rigidly define how the data is to be used. Tables can be added to or deleted from the database or columns and rows can be added to or deleted from existing tables without affecting the data already there and the applications already on the system.

The result is that a relational database is faster and less costly to develop and maintain compared with traditional database schemes. "Maintenance costs for hierarchical systems are so high that you can spend a lot on hardware for a relational DBMS and still save money by comparison," says David Ellis, president of the Data Administration Management Association (DAMA) in Seattle. Hardware performance keeps coming down in price, Ellis notes, but the cost for programmers does not.

Brian Martin, senior software engineer at the Denver-based Astronautics Group of Martin Marietta Corp., says he appreci-

ates that distinction.

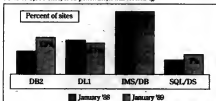
"There's a guy down the hall running a database on IMS, and making changes is so hard that they do it only twice a year. We modify ours on-line every day," Martin says.

Martin has no illusions about the reality behind many of the

scribe the Astronautics Group's application, but that is definitely the way that Martin, whose group maintains the human resource database for five Martin Marietta companies in Colorado, sees it. "This isn't your typical OLTP application, like retail or a bank, but we do a lot of concu-

New blood

While IBM's relational DBMS products continue to make inroads into Fortune 1,000 sites, IMS penetration has leveled off



complaints about relational DBMSs in an OLTP environment. He has seen most of them in action. But, having stuck with Oracle Corp.'s Oracle since Version 2, he can also testify to the dramatic improvement that has taken place in that product since 1983.

Some might quibble with the use of the label OLTP to de-

scribe transactions every day," he says.

In fact, the Martin Marietta human resource system is made up of eight databases, each containing 15 to 150 tables. The entire database requires 750M bytes of memory. The largest table is 750,000 records. Because employees are moved frequently as job locations and assignments

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change, changes to the databases are common. Like any OLTP transaction, Martin Marietta is concerned with throughput, referential integrity, security, monitoring — all the issues that concern a traditional OLTP operation.

The Astronautics Group had no choice but to turn to an RDBMS when it wanted to put its large and extremely complex personnel management system on-line in 1983, Martin says. "We have a matrix management system. That means you have two bosses. You can't handle that with a hierarchical system. You would need two chains."

For that reason, Martin determined that there was no choice but a relational system. Unfortunately, making that decision at that time meant facing the worst problems associated with RDBMSs in an OLTP setting.

Out of the doghouse

"At the beginning, Version 2 was a dog," Martin recalls. "It crashed weekly, sometimes several times." By Version 3, the biggest problems were corrected. With Version 4, productivity began to improve; Version 5 further improved productivity. Version 6, he believes, finally delivers industrial-strength OLTP.

The system now handles as many as 60 concurrent users running Oracle Version 5 on a Digital Equipment Corp. Vaxcluster. The group is testing Version 6, which Martin expects to put on the Vaxcluster as soon as a couple of problems are resolved.

The Martin Marietta experience highlights both the promise and frustration of RDBMSs for OLTP. Undeniably, performance has been a frustrating problem, especially when compared with hierarchical and networked systems, but the RDBMS products have improved steadily.

Not all of the problems with relational DBMSs as a foundation for OLTP have been completely resolved. Questions about speed, throughput, referential integrity, security, recovery, concurrency and fault tolerance still crop up, but there has been considerable progress.

Advocates for the relational approach insist that there are no inherent problems, either in speed or functionality, with the relational model as it applies to RDBMS in OLTP. The problems, as they see it, are the result of poor initial implementations of the relational model by the vendors and deficiencies in the other components of the RDBMS offerings such as inefficient exploitation of the hardware platform.

Vendors are responding by boosting the performance of their systems at both hardware and software levels.

According to Colin White, publisher of "Info DB," a journal based in San Jose, Calif., there are three key areas affecting the performance of an RDBMS in OLTP: the implementation of the relational model itself, the system architecture and the tools. Most of the performance problems in systems that properly implement the relational model, he says, result from a failure to exploit the architecture properly.

Among the software improvements being undertaken are better optimizers, precompiled transactions, I/O pipelining, memory buffering, better disk management, improved data dictionaries, multiple degrees of row-level locking and better table sets.

The newer systems also are likely to allow users to back up and dump data while on-line to allow continuous opera-

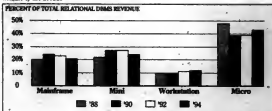
tion. The addition of journaling and mirroring provide recovery capability, allowing the system to return to the last completed transaction automatically after a sudden failure.

A growing number of popular RDBMSs, such as Oracle and Sybase, are available on fault-tolerant systems from vendors such as Tandem Computers, Inc. and Stratus Computer, Inc. to provide truly continuous operation.

On the hardware level, the systems are beginning to take full advantage of multiprocessors, multithreading, distributed computing, caching, increased memory and increased storage. "You want your RDBMS to exploit your processor. Throwing MIPS or hardware at the problem only helps if your RDBMS can really

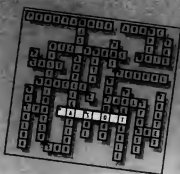
Ebb and flow: Relational DBMSs 1988-1994

The mainframe and mini relational markets should peak in the early 1990s, then fall off slightly; micro relational products should dip in the same period, then pick up toward the middle of the decade.



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OLTP

CONTINUED FROM PAGE 65

take advantage of it," White says.

The real key to the performance of an RDBMS is the optimizer, according to Jeffrey Tash, president of Database Decisions, Inc., a Newton, Mass., consulting firm. The optimizer performs the automatic navigation of the database, he says, after translating the high-level SQL command into a low-level navigational strategy.

The use of an inverted component to reduce I/O and the extensive use of indexes allows the optimizer to boost performance, Tash explains. Furthermore, if enough memory is available, indexes can

be put into memory so that the relational DBMS navigates at memory speed.

The experience of Questar Services, the data processing division of Mountain Fuel Supply Co., a natural gas utility in Utah and Wyoming, illustrates the critical importance of indexing in the optimizer. Questar has been testing DB2 in an effort to determine whether to switch its 20-year-old customer service OLTP system to the RDBMS because of a growing need for flexibility.

Although the Questar system, with 400 concurrent users, does not run particularly high-volume or complex transactions, performance, as seen in response time, is critical. "This system is a major part of the company. This is where we get our revenue," says Jerry Edwards, sys-

tems analyst at Questar's information systems engineering department.

In a test of the system, Questar loaded a table with 300,000 records, with and without an index, and then tried to bring up 15 accounts. Without an index, it took 23 seconds. With the index, it took one second. "Indexing is the key," Edwards concludes.

To assist the optimizer, most of the new RDBMSs offer some kind of precompiled transaction. Essentially, the precompiled instructions allow the system to store the navigation for frequently run transactions so that the system does not have to refigure the navigation each time the operation is called up.

"Sybase gave us something they call 'triggers,' which are stored procedures,"

Mixed breeds

Some vendors have tried to bridge the gap between relational DBMSs and conventional systems for OLTP by developing hybrid systems consisting of a relational-like front end attached to a hierarchical database engine.

This approach appeals to some users because they say it gives them the elements they most like about relational technology while allowing them to stay with an underlying structure they already know can do the job.

The Software AG Adabas system in use at the University of Texas at Austin, for example, provides some relational-like capabilities but retains an inverted file structure. That is all the relational flavor an OLTP environment needs, according to Randy Ebeling, assistant to the director of data processing. "It is the language, not the structure, that needs to be relational," he says.

Many would argue that point, but Ebeling, who ran benchmark tests on a mix of relational and non-relational products from five vendors, is convinced. The university needed to manage five production databases averaging about four million transactions per week, he says, and trying to handle that kind of load with a purely relational DBMS would have required too much hardware.

The reasoning behind the adoption of a hybrid system at the U.S. Customs Office is slightly different. When it decided that a change was needed in the DBMS used to track all shipments and individuals crossing U.S. borders, the Washington, D.C.-based agency simply wanted to combine what it already had — a 7-year-old Datascom inverted list database with a front end incorporating relational-style features.

That reasoning led it to CA-Datcom/DB, a newer product from Computer Associates International, Inc., which is based on Datascom but incorporates an SQL-like front end and a number of relational features including set processing and set selection.

This system was presented as "a production implementation of the relational database," not as a purely relational product, says Clyde McPherson, a CA senior software support manager.

That tack seemed like "the best of both worlds" to Glenn Samples, chief of the database branch of U.S. Customs. The Customs Office operation is large, he says, and it is doubtful that a purely relational system would be robust enough to support 8,000 concurrent users generating an average of 1,300 requests per second.

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says CMT's Chapman. With the trigger, he steers the instructions for a highly repetitive procedure such as inserting a new price. When the procedure is required, the system "doesn't have to reinterpret raw SQL," he explains.

The Sysbase triggers can also be used to enforce referential integrity, Chapman points out. When a certain procedure is activated that would affect referential integrity, a trigger can be used to direct the system to go automatically to the related reference and make the appropriate changes. Additional triggers can further enforce referential integrity right through the system.

Ingres' version of the precompiled procedure is the repeat query. "It is helpful for those queries that take time to opti-

mize but are short to run. Or, if the query is complex or words are a large number of words to parse, we can get performance gains for that, too," Palmer reports. In Version 6, the repeat queries will automatically reoptimize if values change.

The Ingres optimizer takes a near-best solution approach but allows users to tune the optimizer even further, he says. The system allows users to print out the query execution plan. With the printout of the optimizer's navigation, Palmer can look for unexpected occurrences.

"We might see that we need an index somewhere, maybe where we thought we already had one. It's a really helpful fea-



DAAMA's Ellis

ture when a query doesn't perform," he reports.

At the software tool level, there are two types of performance enhancement products now being provided with RDBMS products. One type allows you to monitor what the optimizer is doing; the other allows you to collect better data on which to base its navigation.

Optimizers are designed to make assumptions about the quality of the data, usually based on statistical theory concerning ranges of values and distribution. Often, Palmer says, the optimizer would choose a different navigation strategy if it knew the actual values in the table.

To improve upon the theoretical assumptions, Ingres provides a tool called Optimizer DB, which allows the system to collect the real statistics out of the table. "You can sometimes get a performance gain of 10 times after running Optimizer DB," Palmer maintains. Sometimes, however, there is no change at all.

Early models

Early implementations of RDBMS, used primarily for decision support, had "the flexibility of the relational model and a lot of overhead," says Peter Kastner, vice-president of the Aberdeen Group, a consulting and market research firm based in Boston. "Now, the vendors are putting in the go-fast tricks they learned in non-relational DBMSs, in response to

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Beware the benchmark

How can a user determine if a relational DBMS will be fast enough or robust enough? The only way to tell is to benchmark the specific applications.

Vendors are boosting the overall performance of their RDBMS/OLTP systems, but published RDBMS/OLTP benchmarks are virtually meaningless, consultants say. It is difficult to determine from the benchmark tests how much of the performance gain comes from the improved implementation of the relational model and how much is from more powerful hardware or better use of the architecture.

For instance, IBM's publicly released transaction-per-second rating for DB2 indicates Release 1.3 ran at 123 transaction/sec.; Release 2.1 reportedly jumped to 270 transaction/sec. — a 119% increase. However, Release 1.3 was benchmarked on a 3090 Model 600E, while Release 2.1 was measured on a 3090 Model 600S.

When asked to factor for a constant hardware platform — in this case the 3090 Model 600E — Release 2.1 ran at 186 transaction/sec. and IBM reported only a 51% gain between the two releases. All of the above transaction-per-second ratings, according to IBM, were computed for complex SQL calls, not simple debit/credit transactions.

Hardware power is not the only factor users need to consider. The type of application being run can also influence the relational database's performance.

Robert Davolt, president of DBN Systems, Inc. in Burlington, Mass., is a database consultant frequently called upon to perform benchmarking. He points out, "If you want to run relational in OLTP, then you have to take the time to run benchmarks that reflect your application. Then you know in black-and-white... You're sure. It works or it doesn't."

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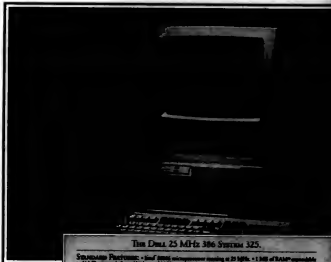
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Misunderstood and maligned, RDBMSs fight a bum rap

BY FABIAN PASCAL

Twenty years after the relational approach to database management was devised, myths and misconceptions are still circulating about what the term really means and what the approach really accomplishes. What follows is an examination and refutation of a few of the more common misapprehensions regarding relational database management systems. Most of the erroneous statements are actually extracts from what has been said in the press, not merely personal interpretations.

MYTH: On the personal computer, relational means multiple. It is a commonly held belief that relational should be defined differently for PC users than for those working in the minicomputer and mainframe worlds.

REALITY: In fact, the relational approach is a universal data foundation, independent of computing platform. Attaching a different meaning to it for the PC is not only a throwback to machine-dependent DBMSs, from which we are desperately trying to escape, but also "multiple" is dead wrong.

Furthermore, there is nothing relational about connecting multiple files by writing procedural code with loops. This extra work is exactly what the relational database operators relieve users from, and those operators should lie at the heart of relational database management anywhere. When they are not part of the relational definition, it becomes useless.

MYTH: The relational approach is too theoretical. SQL can be particularly recalcitrant, the reasoning goes, so users must have a thorough understanding of mathematical sets.

REALITY: This is nonsense. If anybody needs to understand set theory, it is the vendors and for the precise purpose of providing underlying DBMS functions that simplify matters for users and enhance their power. Users need to understand only their data, tables and the logical operations available for them. That is about as unreasonable an expectation as saying that someone who is going to perform an accounting application ought to know arithmetic.

MYTH: The relational approach is too difficult. In long term, the objection usually is that SQL is quite straightforward for simple data access but is more difficult for expressing complex relationships.

REALITY: In principle, this is true of any language. In practice, it is certainly true that SQL, like most programming languages, as a relational language, SQL was designed — albeit, imperfectly — for the precise purpose of simplifying the expression of complex relationships. Try expressing SQL joins in divisions in your favorite procedural language, and it will quickly become apparent which approach is actually more difficult.

MYTH: SQL is only useful for com-

nectivity. If users have no need to deal with a remote host on a daily basis, especially if the host's database is nonrelational, non-SQL programs will do nicely.

REALITY: This misconception stems from a narrow perception of SQL as just a standard interplatform connectivity language. It completely ignores the usability and productivity benefits of the relational

features supported by SQL for any DBMS, whether stand-alone or networked.

MYTH: SQL offers nothing new. The argument here is that the basic SQL commands are remarkably like procedural syntax and are used in the same way. An SQL command, it is said, is a tiny program that opens the database and indexes and deletes the records. The procedural syntax just used to separate commands for those steps and it is, in effect, a kind of optimized query.

REALITY: To begin with, SQL is not a program in any sense. A single SQL statement of what result is needed can hardly be compared to the separate commands required to form a step-by-step procedure of how the system should obtain the

result. Moreover, the programming code that is avoided across the board through SQL support is anything but tiny.

Another critical issue ignored here is system optimization. A relational DBMS handles optimization itself. Programs created for procedural DBMSs burden the user with it.

MYTH: The relational approach emphasizes the wrong things. Instead of being preoccupied with SQL and other relatively obscure database technologies, the next generation of database products needs to deliver powerful features, such as custom menus and data entry screens that nonprogrammers can readily understand and use.

REALITY: The powerful features that are usually mentioned as more suitable

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Pascal is a Washington, D.C., consultant and author specializing in relational database management and SQL as the personal computer. He is affiliated with Cold and Data International.

for attention than relational technology are not database functions but user front ends that must tap relational functions in the DBMS back end. Menus and forms need some underlying database technology or else they cannot work. And it is relational features that enhance the power and usability of such tools.

MYTH: SQL is hard to learn and use. Inexperienced users must be trained to use SQL directly and are likely to be less productive.

REALITY: There are three problems with this reasoning. First, it assumes that SQL is difficult for all users and all purposes. There is ample evidence that this is not true, even for end users. Second, it is simply not true that users must learn SQL syntax. Any relational DBMS can insulate

users from SQL syntax. Most do, and those that do not have only themselves to blame. Third, SQL is not less productive than programming, nor are the tools built on top of procedural engines.

Without a proper understanding of what relational really means, how loyal SQL is to it and what its genuine practical implications are, users will not be able to see through these misconceptions and are likely to fall prey to them.

Therefore, users should educate themselves to use the precise relational features and fidelity rules as the correct criteria. If they do, they can properly evaluate, select and use DBMS products and be able to decide what tools to demand from vendors in order to achieve maximum usability and productivity. ■

Machine niche tightens

BY MARK BREIBART

Database machines are like specialty players on a basketball team — they play well in certain spots but are only called on for unique situations.

These specialized combinations of hardware and software dedicated to database activities were never intended to replace database management systems that run on general-purpose computers. But

Breibart is a *Phoenician* intern for *Computerworld Focus on Integration*.

for large database applications that call for from a relational database, they have been able to claim their share of wins over the years, based on cost and efficiency.

Now however, some of the more aggressive vendors of relational DBMS products are challenging the database machines on their own turf, and analysts say the specialists will have to struggle to hold their places on the court.

The two major database machine providers, Sharebase from Britton Lee, Inc. in Los Gatos, Calif., and Teradata Corp. in Los Angeles, aim at different market segments and use different hardware architectures, but they claim similar advantages for their systems. These systems are not inexpensive — a midrange Server/700 configuration from Sharebase costs around \$300,000, and a Model 2 system from Teradata with 23 processors goes for around \$1.2 million.

But for the jobs they are good at, say users and analysts, such systems can cost less than the alternative of combining RDBMS software with general-purpose computers. Performance is greater, they claim, because machine vendors are able to optimize both hardware and software for a single purpose — handling relational database activity for multiple users.

On the up-and-up

These and other factors convinced the Chicago Board Options Exchange (CBOE) that it needed a database machine to handle a decision support system, which required large databases. The CBOE's main business — the activity on the floor of the exchange — is all handled on several IBM mainframes running TPF and MVS. But for a secondary application, checking the trading for violations of securities rules, Teradata's DB/1012 machine fit the bill. "We knew we had to store large amounts of data without compromising the CPU cycles of our MVS production machine," says Jane Reiske, the board's director of data resource management.

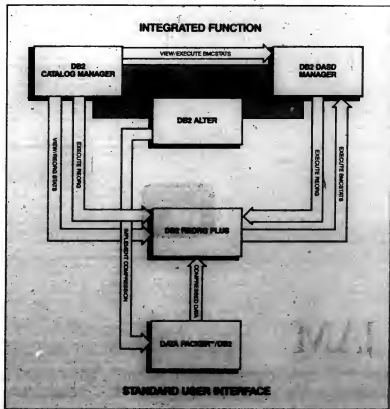
Pricing trades requires nightly updates of data from many sources and then batch reports and ad hoc queries on relational database tables as large as five million rows. The Teradata machine's parallel processor architecture is particularly adept at this kind of chore, analysts say, because it can handle massive updates and full database scans by breaking tasks into smaller pieces and managing them concurrently on different processors.

To handle that load as efficiently with RDBMS software running on a general-purpose machine, Reiske estimates the CBOE would have had to upgrade its IBM to something like a 3090 Model 600. That option, she says, was just not palatable. "We were not interested in buying a CPU that large just to dedicate 50% of it to a database."

For Mervyn's, a Hayward, Calif.-based department store chain, the selling point was price. It put a Teradata behind its IBM 3061 and 3090 early last year to handle two inventory and financial systems. Teradata was about 2½ times less expensive than doing it with DB2, says Jerry Wilson, director of information and

Continued on the next page

ation Combination



Machine niche

FROM PREVIOUS PAGE

administration. "We would have had to add to the 3061 and probably evolve to a 3090, but [millions of instructions per second] on the Teradata are cheaper than MIPS on the mainframe."

Sharebase machines have also been known to save an attention-grabbing amount. When Don Wyner, vice-president at Credit Lyonnais in New York, chose a Britton Lee IDM 500 database machine in 1985, he was developing a system to give commercial lending officers and other officials at the bank's U.S. offices on-line access to all customer banking data. Although he was already plan-

SOME OF THE more aggressive vendors of relational DBMS products are challenging the database machines on their own turf, and analysts say the specialists will have to struggle to hold their places on the court.

ning to buy a Digital Equipment Corp. VAX for other applications, Wyner calculated that to match the performance of the Britton Lee product, he would need to buy at least \$400,000 worth of VAX hardware—double what the database machine then cost.

Despite these kinds of benefits, database machines have never claimed more than a corner of the DBMS arena. In a

market that Teradata's Barnes estimates at \$8 billion to \$9 billion, his company's revenue amounted to only \$120 million for 1988. Sharebase, with an installed base of 1,000 systems, had even less revenue for 1988—\$30 million.

Now, especially for Sharebase, which targets its systems at the department level, software companies are providing stiff competition. Greg Olson, marketing vice-

president at Sharebase, concedes the market is getting tougher. "Back in 1981," says Olson, "we had a sheer performance advantage, particularly if you had a really hard problem in a mini environment. It's not so obvious anymore."

Sybase, for example, some of whose founders came from Britton Lee, has implemented a client/server architecture in software that matches up quite well against its rival, says analyst Jeff Tash, president of Database Decisions, Inc., a division of Hewitt Associates in Chicago.

The impact of the challenge from Sybase is already evident in at least one way. Late last year, Britton Lee changed its name to Sharebase to try to shift the emphasis from performance to the machine's ability to act as a centralized server for a variety of platforms, Olson says.

On the whole, Teradata has fared better than Sharebase, thanks in part to its parallel processor architecture. Not only does that increase the machine's speed for jobs that can be divided up, but it gives Teradata an element of modularity—users can increase the power of their current machines simply by adding processors, up to a maximum of about 1,000.

Also, Teradata's processors use industry-standard chips from Intel Corp.: the 80286 for its Model 2 and the 80386 microprocessor for its Model 3. That helps Teradata's hardware development costs down and makes it privy to the ever-increasing power of those chips. Sharebase, by contrast, has to provide its own improvements to its proprietary hardware.

Nevertheless, Teradata is also now getting a run for its money. Its systems, now installed at 140 sites, are aimed directly at potential customers for IBM's DB2 relational database software.

Waiting in the wings

Teradata is not the only vendor of relational technology hoping to steal a slice of the mainframe RDBMS market, however. Companies such as Oracle Corp., Relational Technology, Inc., Software AG of North America and Tandem Computers, Inc. have all developed improved products, according to analysts, as has IBM with DB2. And, notes San Jose, Calif.-based consultant Colin White, as companies like Pyramid Technology, Inc. and Sequent Computer Systems, Inc. go to parallel processing, using cheap microprocessors MIPS, Teradata's advantages will shrink. Still, White adds, the competition has a way to go.

Bell Atlantic Corp.'s marketing division in Madison, N.J., reached the same conclusion in mid-1988 when it chose a Teradata system over DB2 to handle a database of its 1.3 million telephone business customers. The group wanted to put in one location all the customer marketing data, which was then spread throughout the firm on a variety of production systems running on IBM, Honeywell, Inc. and DEC equipment. The goal was to provide an on-line decision support system that would let the marketing staff look at any slice of the customer base.

DB2 was already running on the division's IBM 3091. But, according to Ed Moschetti, the division's information systems manager, when the Teradata outperformed DB2 by a margin of 7-to-1 on some prototypical benchmark queries, the choice was clear.

For potential users, the issue may no longer be so clear-cut, and database machines may have to work harder to stay in the game. ■

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Before you make the switch ...

BY ROBERT GILMORE

In planning the transition to relational database technology, MIS managers need to give careful thought to structuring the operating environment to maximize use of the new technology.

A first step in making the transition is to optimize the use of the existing environment prior to installing the relational product. Relational database systems require significant processing resources. Rather than face immediate capacity problems, assemble the best individuals available and optimize both on-line and batch environments before implementing your first production relational system.

Both the operations and capacity planning groups must be involved up front with the implementation. Traditionally, these are the last groups to become involved, and they do not appreciate surprises in terms of DBMS and application resource consumption. Anticipate what a relational DBMS is going to do to your operating system environment and plan a strategy to accommodate the growth.

Next, identify the system administration function that will be responsible for the testing, implementation and control of the relational environment. This group should oversee the standards, policies and procedures needed to manage the transition. It should ensure that resources are properly utilized and that database/data communications activity can be accurately monitored and measured.

Consider isolating decision support systems (DSS) from production, or response-sensitive, applications. As the number of users increases, the data manipulation capabilities associated with complex ad hoc requests will cause degradation of the production system if both are running in the same address space or under the same copy of the software.

Learn the relational product's capabilities and limitations. Be prepared to implement centralized control over the production environment and distributed control over the DSS and test environments. Remember, once control is lost — or if it is

never achieved — it is, in most cases, unreasonable to expect that it will ever be properly established.

Data conversion issues

To actually build the environment, much consideration must be given to data conversion. This is never a job that takes the time anticipated — instead, count on at least five times longer than expected.

Ideally, a task force or project team should address the following tasks related

to data conversion:

- Identify the data elements to support the project or projects being migrated.
- Identify the source of the data and the data's owners. Establishing ownership is important — this is where parameters for the validity of the data are determined.
- Spend time up front to identify valid ranges of data and values, where appropriate, so that adequate edit rules can be applied as the data is being loaded into the new environment. Moving "dirty" data from one environment to a new one makes no sense.
- Identify what data will reside in each environment (production or DSS) and what data will be shared or duplicated.
- Identify all internal and external audit requirements for the data. Doing so will

allow you to build audit procedures or identify alternate processing solutions.

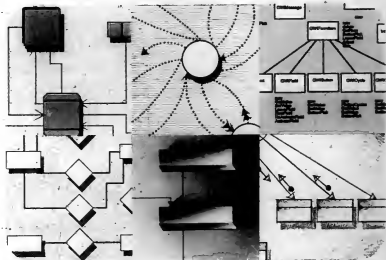
Relational technology gives MIS personnel the opportunity to become involved in critical design tasks such as logical design and normalization. It also provides an opportunity to use the phases associated with a system development methodology as the discipline for completing these tasks.

Organizations can now place more emphasis where it belongs — on the data. While the transition may not be a simple process, it does not have to be painful.

Gilmore is vice-president of Consulting Services, a management consulting service offered by Data Base Management, Inc. in Manchester, Conn.

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	DBSingle	IBM VSE/VS	SQL	ANSI	No	Readonly, does not allow updates to individual data elements, update to individual data element or entire database	No	No	Incremental backup, emergency database restoration, point-in-time database backup	None	Workshop-based user interface, report generator, statistical analysis modules	Yes	No	No	Yes	\$1,495 (license)
Aurora Corp. (616) 990-7926	RDMS/2 Database Management System	Unix, VMS, AOS/VS, AOS/VS, VME, UNOS, TMS, OS/2, VM/CMS	SQL, Proprietary (SQL)	ANSI	No	Retrieve, update, insert, delete to database level	No	Yes	Time and space with database	Database dump and load, user ID	Code, Fortran, Mapper, C	Yes	Yes	Yes	Yes	\$145,000 to \$114,000
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	Interv Database Computer	GCOS 8	SQL, Proprietary (SQL), Lark, MVS & PC/2	ANSI	Yes	Select, update, delete and insert to column-level	Yes	No	Fault-tolerant, monitoring	Archiving/recovery, statistics, crash dump backup	NP	Yes	Yes	Yes	Yes	NP
Carnegie International, Inc. (616) 990-7926	InfoBase Plus	VMS	QueryPlus	SQL	Yes	Read, write to database, field level	No	No	Journaling	Direct loading, debugging, runtime statistics, backup, recovery, report writer	Screen-based user interface, report generator, report writer	Yes	No	No	No	\$21,000 to \$99,000
	InfoBase Plus	VMS	QueryPlus	SQL	Yes	Read, write to database, field level	No	No	Journaling	Direct loading, debugging, runtime statistics, backup, recovery, report writer	Screen-based user interface, report generator, report writer	Yes	No	No	No	\$21,000 to \$99,000
Century Analytics, Inc. (415) 990-7900	CPMS Central File Management System	NCR VME, VME/386	Proprietary (SQL), Lark, MVS & PC/2	NA	Yes	Retrieve, update, insert, delete to file, record and field level	Yes	Yes	Roll forward, rollback	Report writer, access controller, user generation, user registration, conversion language facility, transaction execution facility, transactional	Screen graphics, interactive file maintenance	No	Yes	Yes	NP	\$8,000 to \$40,000
	CPMS Central File Management System	NCR VME, VME/386	Proprietary (SQL), Lark, MVS & PC/2	NA	Yes	Retrieve, update, insert, delete to file, record and field level	Yes	Yes	Roll forward, rollback	Report writer, access controller, user generation, user registration, conversion language facility, transaction execution facility, transactional	Screen graphics, interactive file maintenance	No	Yes	Yes	NP	\$8,000 to \$40,000
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	Powerhouse Database	VMS	SQL, Proprietary (SQL)	ANSI	Yes	Read, write, control definitions to database level	Yes	No	Full and tape backup with operator-controlled growing, partitioning of multiple databases to the same journal	Dictionary maintenance, reporting, structure validation and repair, structural back-up/recovery	Powerhouse 4GL, GLL (proprietary)	Yes	Yes	Yes	Yes	\$2,000 to \$200,000
Computer Systems, Inc. (616) 990-7926	Database II	Unix, VME/386, IBM, OS/2, TMS, OS/2, VM/CMS	SQL, SQL	ANSI	Yes	Retrieve, update, insert, delete to table, column, row or field level	Yes	Yes	Journaling, rollback	Performance monitoring, tuning	System 1032 Application System	Yes	Yes	Yes	Yes	\$2,000 to \$180,000
	Database II	Unix, VME/386, IBM, OS/2, TMS, OS/2, VM/CMS	SQL, SQL	ANSI	Yes	Retrieve, update, insert, delete to table, column, row or field level	Yes	Yes	Journaling, rollback	Performance monitoring, tuning	System 1032 Application System	Yes	Yes	Yes	Yes	\$2,000 to \$180,000

*Also supports microcomputer operating systems

The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

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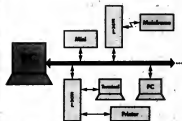
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PRODUCT SPOTLIGHT

[illegible]

PRODUCT SPOTLIGHT

85

COMPANY	PRODUCT	OPERATING SYSTEM(S) SUPPORTED	QUERY LANGUAGE SUPPORTED	VERSION OF SQL	INCLUDES DATA DICTIONARY	CONTROL WHAT TYPE OF ACCESS AND TO WHAT DATA LEVELS?	PERFORMS RECORD LOCKING WHILE READING DATA	SUPPORTS POINT-IN-TIME RECOVERY	OTHER BACKUP AND RECOVERY CAPABILITIES	DATABASE ADMINISTRATOR UTILITIES	INTERNAL APPLICATION DEVELOPMENT TOOLS	AVAILABLE REMOTE ACCESSIBLE	PERFORMS REMOTE BACKUP	OTHERS ENTRY RELATIONSHIP INTEGRITY	OTHERS DOMAIN INTEGRITY	SUPPORTS DATA COMPACTION	PRICE
Progress Software Corp. 10000 Progress Dr. Pittsford, NY 14534-2000	Progress 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Read-only table lock and read-write table lock	Yes	Yes	Backup image and restore	Database analysis, index rebuild	Report writer, application generator	Yes	Yes	Yes	Yes	Yes	\$1,000,000 (\$150,000)
Quadrant Corp. 2000 75th St #777 Pittsburgh, PA 15206	Quadrant 4	IBM, VME	Progress 4GL	4GL	Yes	Yes	Yes	Yes	Yes	Backup database	4GL, SQL	Yes	Yes	Yes	Yes	Yes	\$12,000 to \$27,000
Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	4GL, SQL, cross platform, report writer	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
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Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
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Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
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Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
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Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
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Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
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Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
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Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join	Yes	Yes	Journaling	Performance tuning, index rebuild, backup	Yes	Yes	Yes	Yes	Yes	Yes	\$20,000 to \$45,000
Relational Technology 10000 Progress Dr. Pittsford, NY 14534-2000	Relational 4GL	IBM, Sun, VME, Intel, Apollo, HP, Cray	Progress 4GL	4GL	Yes	Backup, update, insert, delete, select, join											

IN DEPTH

Systems design: Users in the hot seat

JAD platform plus CASE tools automate early collection of user expertise

BY JAMES D. KERR

From code generation to reverse engineering, there are many exciting trends shaping today's systems development world. One of the most intriguing is automated joint application development (AJAD). AJAD integrates computer-aided software engineering (CASE) tools and JAD techniques to form a new development platform that is sure to change the way systems are built in the future.

By definition, JAD — originally developed by IBM in 1977 — places the end user and the systems analyst together on the same project development team. The team defines and documents the systems requirements through the user's eyes rather than the analyst's. While use of this technique may seem obvious, it is not yet well-established in the information systems world.

Under JAD, once the systems requirements are defined and reviewed by

Kerr is director of data architecture at The Equitable in New York and an adjunct professor in information systems at Ramapo Polytechnic Institute in Troy, N.Y.



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the users and analysts, they are turned over to a design team made up of database administrators and programmers who convert the requirements into an actual system of databases and programs.

The JAD methodology is based on the assumption that IS can build better systems by harnessing user expertise in the development process. It encourages computer literacy among business professionals, thereby reducing

the familiar organizational barriers to systems design — obstacles well-documented by user comments such as, "We're sick and tired of these faulty systems." With JAD, users take more responsibility for the resulting system because they have played a part in building it.

CASE, on the other hand, automates what the IS professional does. CASE workbenches provide systems developers with the tools they need to define

the data and process specifications for a system. CASE immediately improves IS' capability to communicate with users by diagrammatically representing their requirements. And because it is automated, CASE allows for easy modification of previously defined system designs.

A tremendous productivity opportunity arises when CASE is folded into the JAD process. The simple addition of automated

- Design is their responsibility, too
- Eliminates cut-and-paste development
- "Fly solo" after first success

tools introduces a design discipline that is difficult to match by any manual approach. In fact, AJAD can reduce development time by as much as half, compared with traditional systems design methods.

Getting started

The following critical questions must be addressed by the IS manager in charge of the AJAD program:

- What tools should be used?
- Which project should be the pilot?
- Who's on the AJAD team?

When addressing the tool question, many IS organizations will of course be inclined to use the CASE tools they already own. That is fine, as long as the tools can graphically depict data and process models, paint screens and generate reports. But many tools cannot.

If the current tool set does not cut the mustard, IS should consider acquiring some new ones before embarking on AJAD.

Among others, tools such as Index Technology Corp.'s *Executive* and Teton Instruments, Inc.'s *Information Engineering Facility* make fine AJAD aids because their personal computer-based graphics components allow users to quickly define and modify systems specifications

without having to consult a mainframe repository.

Once the tools are in place, the IS manager should get together with a user manager to define a viable pilot project. As with any pilot, it is wise to choose a project that is off the critical path, one that can be developed quickly and has a relatively low possibility of failure. Operational systems such as payroll, accounts payable and order entry are preferable to strategic systems such as advanced stock market analysis, expert underwriting or computer-integrated manufacturing.

An IS manager can minimize the risk of AJAD failure by selecting a project that his development staff is familiar with or even one they may have programmed before.

The AJAD team

There are six main members of a typical AJAD team: the executive sponsor, IS manager, AJAD facilitator, AJAD scrubs, IS developers and end users.

The executive sponsor is a senior-level manager from the user firm — often the manager who helped choose the pilot project — who can ensure the level of commitment needed to make the AJAD project a success.

• The IS manager spearheads

A sample AJAD session

In this AJAD meeting at an insurance company, a facilitator drives the discussion with the user, the IS staff interprets it, and a scrubs uses CASE technology to document and project the system design.

Facilitator and user conversation	IS staff interpretation	Scrubs' data model
F: Can a client own more than one policy? U: Yes. F: Do we maintain information about potential clients? U: That's how we stay competitive. F: Do we put policy information in the books before we sell a policy? U: No.	There is a one-to-many relationship between client and policy with an existence dependency that states, "Clients are created before policies."	
F: What other information do we maintain? U: Premium information is important. F: How does that relate to policy administration? U: A policy generates many premiums over the year it is in force. F: Does every policy generate a premium? U: Yes, and it's recorded at the time of sale.	There is a one-to-many relationship between policy and premium with an existence dependency that states, "These records are created at the same time."	
F: What about beneficiaries? U: Yes, we track them as well. We have to know who gets the check. F: Can a client have more than one beneficiary? U: Absolutely.	There is a one-to-many relationship between client and beneficiary with no existence dependency stated.	
U: I'm not sure the design is correct. F: Oh, really? Why? U: We keep track of beneficiaries not by client but by policy. F: Can we have more than one beneficiary per policy? U: Yes.	There is a correction of the model to eliminate the client-to-beneficiary relationship and to create a policy-to-beneficiary relationship (one-to-many). These records are created at the same time.	

CR CHART: JOHN NORD

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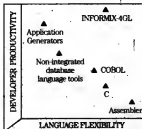
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the AJAD movement. This person is responsible for selecting the proper tools and choosing the team to kick off the AJAD effort; he also works with the executive sponsor to select an appropriate pilot project to test the new development approach.

- The AJAD facilitator is a user analyst or senior systems analyst who has terrific communication skills, knows the tools, understands project management and has an appreciation for group dynamics. The facilitator is a team builder.

- The AJAD scribe is the tools expert. This person is a top-notch systems analyst who knows the tools inside-out. The scribe can transform a user's response to a question into a diagram representing a system specification.

- IS developers are the professionals charged with actually building the system. They are the programmers, analysts and database specialists who need to better understand the user's requirements before creating a



systems implementation.

- Finally, end users are the subject matter experts. They know the business better than anyone else. They are the ones that will define the systems specifications and comment on the designs as these elements evolve during the AJAD process.

In addition, many organizations just starting out in CASE or JAD may find it necessary to use consultants on their first AJAD project. Consultants can play active team roles like scribe or facilitator, or they can be used less frequently as advisors or trainers. Either way is acceptable, as long as the consultants possess the necessary expertise and can effectively transfer their skills to the rest of the AJAD team.

There are many sources of good consulting support available in the marketplace. CASE vendors are prime sources of tool training and expertise, while project development and methodology consultants can be sought as JAD advisors and facilitators.

Keep in mind also that you can try solo after the first success.

The first AJAD session
After the team members are identified and tapped, the IS manager should carefully plan

MANY ORGANIZATIONS use consultants on their first AJAD project. Consultants can play active team roles like scribe or facilitator or can be used less frequently as advisors or trainers.

the first AJAD session. Realizing that commitment is the key to any successful AJAD project, IS should try to boost team morale with a good, strong start.

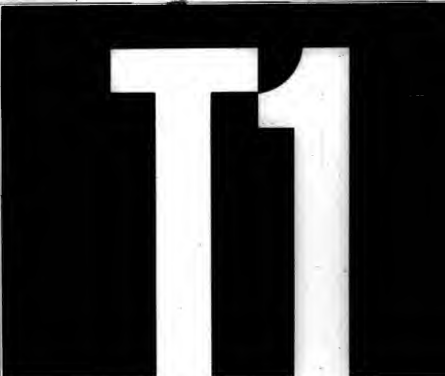
An executive statement of support is a great way to kick off the project. The executive sponsor should make an appearance at the first AJAD meeting, stating

management's expectations and reinforcing the organization's dedication to the AJAD program.

Because the AJAD process

will end up requiring four hours of work a day, five days a week, the team members should know that they have management's support from the very beginning.

After the executive send-off, the team can begin work. The IS manager first introduces the AJAD facilitator. It is important that the facilitator come well prepared. This person sets the



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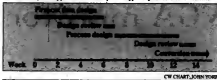
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The AJAD life cycle

Automated joint application development typically takes 3 to 4 months



tone for the whole process, reviewing the project's scope, objectives and assumptions with the AJAD team.

For instance, the facilitator should take time at the outset to mention that AJAD is a highly interactive and visual process, one marked by facilitator questions, user reaction and IS interpretation. The scribe translates what is being said into system dia-

grams and prototypes, which are projected onto a screen in the AJAD meeting room. IS developers contribute to the process by raising key design issues and helping the team make appropriate design decisions as the project evolves. The chart on page 88 depicts the evolution of a typical AJAD meeting.

Notice in the chart how the data model evolves as the discus-

sion regarding an insurance application unfolds. The first scenario shows the definition of the client and policy data relationship. The premium entry is added in the second level. The third iteration adds the beneficiary information to the model. The fourth scenario illustrates how easy it is for participants to raise important issues and improve the quality of the design.

This sample session exemplifies the ease with which models can be developed through an AJAD process. It eliminates the cut-and-paste method associated with unautomated development approaches. Plastic templates are replaced by precision design tools such that design in a vacuum makes room for interactive development.

AJAD life cycle

Compared with a JAD procedure without automation, which typically takes six months to a year to complete, an AJAD project typically lasts three to four months (see chart this page). The first six weeks are used to define a first-cut data model. The deliverables include an entity relationship diagram as well as an entity list and attribute definitions. The AJAD team must work diligently in order to complete the models in the six weeks.

Once the first-cut design is complete, the next week is spent reviewing the design with key users — excluding those on the AJAD team — and the executive sponsor.

Objectivity is the reason for not including AJAD team members in the review process. The ego involvement of team participants can sometimes hinder their honest appraisal of the design.

Upon completion of the review, the AJAD team reconvenes and begins work on the processing components of the design. The deliverables of this phase include process hierarchies and dependencies as well as program logic definition.

A finalized design review is conducted by Week 14. Design refinements and executive sponsor sign-off is necessary before

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*Datapac, User Ratings of Network Management Systems, September, 1988.
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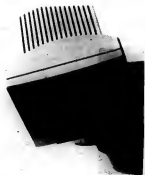
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the models can be converted into database designs and programs.

Conversion can take weeks or months, depending on the complexity of the designs and the sophistication of the CASE tool. It should be noted that tools providing automatic code and design generation can cut in half the time required to convert even the most challenging projects.

The power of AJAD is

achieved when CASE tools are first used in a scheduled JAD session. This can happen by accident — as when a forward-thinking project manager or programmer/analyst suggests the team consider using a CASE tool in the next JAD session — or by design, as discussed here. Within no time, a development environment is created that combines the quality of user-driven design

with the productivity of automated systems construction.

The AJAD process shifts the burden of proof of systems development away from the IS staff and toward the users, who are ultimately responsible for the operation of the business. AJAD provides a mechanism for users to resolve their conflicts while improving IS' ability to build timely and accurate systems

through the use of rigorous CASE tools.

AJAD is an idea whose time has come. By implementing the approach, IS can combine the quality of user-driven design with the precision of CASE technology to create a highly productive development environment that is capable of delivering the systems that will keep our firms competitive for years to come. ■

Project log

Below is a typical automated joint application development (AJAD) project log, which follows the week-by-week AJAD lifecycle (see chart page 93):

• **Weeks 1 and 2:** Team building exercises, data modeling, training, review of business models and initial data model graphics. No discussion of attributes.

• **Weeks 3 and 4:** Refinement of data models, attribution of entities and initial descriptions of attributes — for example, definitions, field lengths and data types. No discussion of volumes or entity-to-entity ratios.

• **Weeks 5 and 6:** Completion of first-cut data design, attribution, definition, volume and ratio estimates as well as a validity check against business models.

• **Week 7:** User reviews of first-cut design, refinement notes and design changes.

• **Weeks 8 and 9:** Process modeling training, review of finalized data design, initial process hierarchy design and process dependency design. No discussion of process logic.

• **Weeks 10 and 11:** Refinement of process hierarchy, process dependencies and initial process logic definition. No discussion of program-run volumes.

• **Weeks 12 and 13:** Completion of procedure designs, including hierarchies, dependencies and process logic; completion of run-volume estimates; and validity check against data design.

• **Week 14:** User reviews of finalized data and process designs, refinement notes and design changes and user sign-off.

• **Weeks 15 and on:** Conversion of data design into database, conversion of process design into programs using high-level languages or program generators, screen and report layouts using prototyping, systems testing and turn-over to production.

JAMES M. KERN

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TAKING CHARGE

William R. Brittain

Our personal perspective

Like our technology, programmers come in generations, each with a set of values and work methods that match the evolution of the industry. The changes reflect not only the state of the information sciences but also larger sociological happenings that shape a generation of people.

I am familiar with three generations: the one ahead of my generation, my own and the one following mine. In each instance, the experiences that shape those working generations occur in the first working years, when the majority of workers are in their 20s.

Power and influences begin to emerge in a generation during their 30s and become consolidated in their 40s and beyond. The incoming generation is the life and energy that pushes the others forward.

The differences

The generation of programmers before mine began in the industry by actually wiring circuit boards and programming on machines that may have had a total random-access memory of 64K bytes for the operating system and all of the business applications that were developed. This generation does not take systems methodologies, structured programming standards, structured programming theories or systems design theory seriously.

But these programmers always get the job done with at least one or two examples of work that go beyond expectations while letting other areas go along less formally. They invented the notion that programmers do not like documentation. All of the books, theories and new declarations of the advancing information sciences are like new clothes on a child whose birth they attended.

My generation lived through Vietnam, women's liberation, structured programming and the conversion to virtual operating systems and database management technology. Somehow, there is a relationship there, but I am too close to the situation to see it. Perhaps it is that the changes both in our society and in the industry were fundamental.

Continued on page 100

Erbrick delivers for United Parcel Service

BY AMY CORTESE
OF STAFF

PROFILE Frank Erbrick

PARAMUS, N.J. — Frank Erbrick clowns around, donning a fur hat from China given to him by one of his staff. In it, he looks more like the avid camper he is than the man that manages the information needs of an \$11 billion package delivery service.

As vice-president of information services at United Parcel Service of America, Inc., Erbrick is not your average IS executive. A former butcher, he has been with UPS for 26 years — most of that time in accounting and operations. Like most people at UPS, he spent time driving a delivery truck and he worked his way up the ranks. Described as friendly, outgoing and even "a bit bombastic," Erbrick, 49, is known for always having a humorous story to tell. His office is a place where people at all levels of the company feel comfortable and he frequently be heard walking through the halls, Erbrick has a hearty greeting or slap on the back for everyone.

Erbrick displays an almost paternal concern for his staff and is known to send care packages of food and magazines to his overseas staff in the 42 countries in which UPS now operates. Systems programmer Bryan Hartman, a cure package recipient who presented Erbrick with the fur hat upon his return, says Erbrick has always reminded him of his father. "They both have that



Position: Vice-president of information services, United Parcel Service of America, Inc.
Mission: To provide information services to bolster the company's expansion while maintaining an atmosphere encouraging mutual input at all levels

Perry Mason look," he says.

Erbrick started at UPS as an accounting supervisor, moving on to stints in operations and customer service and most recently as controller for UPS' Pacific region.

In February 1985, Erbrick was assigned to IS, moving back to take the second-in-command position at UPS' Paramus, N.J.-based information services division. He was quickly promoted to vice-president of information services in August of that year and assumed responsibility for all computer systems.

Although he admits to not being thrilled with the assignment at the time, Erbrick says having

mean position at UPS' Paramus, N.J.-based information services division. He was quickly promoted to vice-president of information services in August of that year and assumed responsibility for all computer systems.

Although he admits to not being thrilled with the assignment at the time, Erbrick says having

such a significant impact on UPS and experiencing the "pride of accomplishment" of his staff has made it "the most invigorating experience of my career. Anything I do after this will be anticlimactic."

Acknowledging that he does not have a technical orientation, Erbrick says he believes in delegating authority, letting his staff make the decisions. "People have to know they're allowed to fail," he says. "You have to let people know you have faith in them."

Erbrick's staff says he does not need technical expertise to manage them. "The way he relates to people and can hold attention at a meeting" are more important, Hartman says.

Employee-owned UPS has a strong corporate culture rooted in the ideology of UPS founder James Casey, who strongly believed that the company's greatest asset is its people. This philosophy is reflected in Erbrick's egalitarian management style.

"He's the kind of manager that works hard and sets a good example," says UPS Executive Vice-President Kent "Oz" Nelson, Erbrick's boss. "People relate to him well."

Erbrick has instituted a policy under which everyone, managers and Erbrick included, shares the work on holidays when the pace is stepped up instead of leaving junior employees with long and undesirable shifts. Er-

Continued on page 101

IS looks to user base for consulting services

BY ALAN J. RYAN
OF STAFF

CHICAGO — When it was time for a major systems revamping at the Gas Research Institute (GRI) here, it seemed logical to look to consultants. What some might say was illogical was that those consulted were nearly all GRI employees holding non-IS positions, from clerical workers to vice-presidents.

However, the result is a system that everyone can live with and that many non-IS employees take pride in having helped design, according to director of information systems Hugh Naughton.

GRI went with the nontraditional approach to systems overhaul, which Naughton labeled

"process flow analysis," to get a clear sense of what the users required in a system, not what the systems people thought the users needed. "We talked to people at every level in the company," he said.

Company specs

Gas Research Institute performs research and development for the natural gas industry, from producers that extract the gas from the ground to consumers such as home and business users of gas. The nonprofit company employs approximately 275 people and works with a \$175 million budget to manage some 500 active R&D projects at any given time, Naughton said.

In 1984, GRI officials decided that something must be done

Data View Pros and cons

The greatest strengths of MIS in the industrial services sector* are also its greatest weaknesses, according to a survey of 50 information systems execs

Strength	Weakness	Strength	Weakness
Systems	11	People	11
Hardware	6	People	9
Employee retention	8	Schedule	6
Schedule constraints	8	Employee retention	6

* Includes businesses such as personnel and maintenance services.
SOURCE: RESEARCH-INDUSTRIAL SERVICES CO. (BY STAFF-PAUL C. COOPER)

with their systems. There were discrete systems for all of the different areas of the company: budgeting, planning, contract management, financial management and membership management. Naughton's job in 1985 was to get started on plans to integrate all of those Wang Laboratories, Inc. systems and rid the company of expensive dupli-

cation. He was also told to retain the company's significant investment in Wang hardware.

A two-day workshop with departmental representatives was called in the fall of that year. "It was an interactive workshop designed to elicit their ideas on what the system should look like when it was completed two years

Continued on page 99

IS looks

CONTINUED FROM PAGE 97

hance," he said. That workshop proved that the decision for integration was one that was widely supported.

Calling together non-IS workers to help design a new system brought about some apprehension from the workers, and there was also some tension because entry level and support staff personnel suddenly had to work closely with upper-level management, Naughton admitted. Once the group started working, however, those tensions and apprehensions quickly melted away because the members started off with the same limited knowledge of systems, he said.

Two years, many meetings and several system prototypes later, the integrated system was put into place. Much of the system was designed by outside consultants based on the needs outlined by the work group.

Wang migration

Under Naughton's direction, GRI has moved from one Wang VS 100 and one VS 85 minicomputer to one VS 300, one VS 7310 and two VS 85s. While he admits that building on a base of Wang equipment gave him some sleepless nights during the development process — "There was always the possibility that we had overreached in terms of the hardware, operating system and database management capabilities, and even today we have a

problem with slow response time" — Naughton said he is generally pleased with the Wang hardware. The company is slated to be one of the first recipients of the new Wang VS 10000, which will significantly improve throughput and CPU time, he said. The software being used is Wang's Pace relational database management system.

Two months after the system was installed, another workshop was held, this time to solicit reaction to the system which the workers had helped to design, Naughton said.

"The people who attended the workshop were primed to talk about the system," Naughton said. "It introduced technology to them that they had not experienced before, and it brought to the

company's business operations a discipline that had never been heard of before." Some of the feedback was negative because the employees found that the new system forced discipline.

The integration of the data turned the system's various database portions into blocks on other portions of the database, Naughton explained. For instance, when preparing the budget prior to the upgrade, any change in the budget numbers would be made in a word processing system but would not automatically be updated in the database. "By the time the word processing document was published, the numbers in the computer became almost meaningless," he said. The new system assures the integrity of the database at all times.

Attitude improvement

The system has been in place for more than a year, and many user-friendly adjustments have been made to it during that period, Naughton said. Even extensive prototyping cannot create perfect systems, he warned.

"When using prototypes, you've got to ask the question, 'Are we doing things right, or doing the right things?'" he said. When a user is shown a prototype, he can become enraptured by the new technology and lose sight of crucial business elements that are missing, much as the developer becomes excited about the prototype and may leave out a critical algorithm, Naughton said.

But even now, the systems are still being closely studied. A review committee of users was set up in January to look at proposed software projects and rate them by priority. Also, a database administrator's forum was established once the system was implemented to help inform users of changes, modifications or enhancements to the database or the system.

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Kaiser Aluminum
sells data center
to start-up firm

COLUMBUS, Ohio — The recent sale of Kaiser Aluminum & Chemical Corp.'s Midwest Regional Data Center here has meant a smooth transition for the 16-member staff.

Kaiser sold the data center as part of an approximately \$250 million asset sale package — including two aluminum reduction plants in Ravenswood, W. Va. — to Ravenswood Aluminum Corp., a new firm headed by a former Kaiser vice-president who managed the Ravenswood operation. Ravenswood Aluminum was formed by Stanwick Partners, Inc., an investment firm in Stamford, Conn., that paid \$168 million in cash and assumed debts of \$88 million.

The data processing operation was renamed the Ravenswood Data Center, but that was about the biggest change, according to Operations Manager George DiBacco. "We did 70% of our work for the Ravenswood plant already," he said. "We will retain some of the work for Kaiser."

The data center supports Ravenswood's aluminum processing with an IBM 3081 D and 3085 EX running MVS/3A, DOS/VSE and VM.

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MANAGEMENT BRIEFS

Certification group airs revamped exam mode

The Institute for Certification of Computer Professionals (ICCP) in Des Plaines, Ill., announced that it has begun preparing new versions of its certification examinations that will go into effect in January 1990.

The new structure, which the ICCP said will be more challenging, is a response to market demand for certification in new areas of specialization, market demand for testing depth vs. breadth in specialty areas and a need to improve efficiency in developing ICCP exams.

The exam structure will be based on a single core exam required for all designa-

tions and will be put in place for certified data processor, certified systems professional and certified computer programmer designations and associate computer professional certificates.

The core exam will be designed to test "the main areas of knowledge required of every information systems and information technology professional." ICCP President Mike Maier said.

The overall testing period will be two hours longer in the new structure, because all candidates will be required to pass two specialty exams in addition to the core exam, Maier said.

Current candidates for certification will continue to use the existing test. The revised exams will be given for the first time in May 1990. Any candidates with exam sections left to complete in the present structure will be able to continue in that structure through the period defined in the application announcements.

The Computer Measurement Group, Inc. (CMG) is seeking papers to be presented at the CMG '89 International Conference slated for Dec. 11-15 in Las Vegas. Papers should describe new ideas or techniques or should report on experi-

ences of success or failure in the computer performance evaluation area. Abstracts are due by April 3. Inquiries should be directed to General Chairman, CMG '89, CMG Headquarters, 111 E. Wacker Drive, Chicago, Ill. 60601.

The Twelfth Western Educational Computing Conference, slated to take place Nov. 16-17 in Burlingame, Calif., is seeking papers dealing with computers and computer applications in areas of interest to instructors and administrative personnel dealing with computers at the college or university level. For more information, contact Dr. Oliver Seely Jr., CSU Dominguez Hills, Chemistry, 1000 E. Victoria St., Carson, Calif. 90747. The deadline for submissions is April 21.

Britain

CONTINUED FROM PAGE 97

tal and are still being reckoned with in many quarters.

The elements that were introduced have become a permanent part of the scene: women in business, database management systems and a growing awareness of the need for interpersonal communication, even as business had to recognize the need for telecommunications.

Most recently, this mixed marriage of men and women, formality and informality and technology and innovation has given birth to a little monster called the personal computer and a new generation of software that is like a teenager who has not quite yet lived up to his potential.

Unfortunately for the newest generation of programmers, the world of data processing still has a lot of the old along with the new. Some of these programmers predict that their careers will be short-lived. It must certainly be confusing and a lot more difficult to navigate — there is so much out there.

From its relatively small beginnings, the DP world has grown into one as varied as the real world, having distinct subcultures along with a particular native language. The choice of these new programmers in the industry is the same as the personal choice of any young man or woman: finding some stability and security while learning about the rest of the world. It is no small task for anyone, personally or professionally.

It is appropriate that one of the most well-known fourth-generation software packages is named Focus. That is the problem, isn't it? Where do we focus our efforts, our careers, our personal lives and our goals?

Years ago, when Victor Frankl wrote *The Search For Meaning*, he was talking about the search for a focus in our lives. The 1980s have brought a new focus on the personal along with PC technology.

That personal focus is the emphasis in business, in our health clubs and in the popular media, only now it seems to be reaching out to something, pulling the world back together.

Mass media is becoming personal media. We are once again valuing personal creativity but as an experience that must be shared and that combines all of those elements of individual ability, communication, meaning and focus.

Britain is a senior programmer analyst at Capital Holding Corp. in Louisville, Ky.

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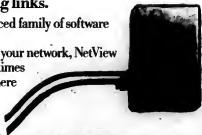
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Erbrick

CONTINUED FROM PAGE 97

Erbrick himself works shifts loading tapes. UPS is a very method-oriented company. Routine procedures are systematically studied for ways to make them more efficient. For instance, drivers observe particular guidelines designed to save time such as stepping up onto the truck with the left foot, which eliminates unnecessary steps, and picking up a package at diagonal corners so it can easily be spun around to locate the address.

Erbrick has attempted to bring such methods into IS. Service to IS customers is constantly measured, and weekly reports are generated and distributed to all

staff. The number of calls per day to the help desk are recorded as well as the time spent responding. User satisfaction is frequently measured by asking users if they got the help they needed.

Because of demands for increasingly skilled employees, UPS has only recently relaxed its hiring policy of requiring all employees to start at the ground level, either sorting packages or driving trucks.

IS is therefore made up of employees from the old school who have worked their way up as well as new hires from the outside. Erbrick is aware of the potential for resentment between the two groups of employees; one way he tries to bring his staff closer is to get them involved in projects together.

UPS is known as a charitable organiza-

tion, and IS is one of the firm's most active groups. Recently, members of the IS staff and Erbrick spent several weekends painting and fixing up Seton House, a home for unwed mothers in Jersey City, N.J. During this project, Erbrick was just one of the workers, taking his assignments from an IS staffer who was appointed project leader.

Erbrick likes to say that all this makes his people feel good, but one can tell from the enthusiasm in his voice that it makes him feel good as well.

Erbrick is in charge of all of UPS' worldwide computer systems, including both air and ground operations. He oversees almost 800 employees at the main data center in Paramus, N.J., as well as 400 in the field.

Although for many, UPS may conjure up an image of familiar brown delivery trucks bearing gifts, the company has rapidly expanded into global markets and has literally become an airline with a fleet of more than 100 commercial-class planes.

As UPS has expanded, Nelson says that the company has begun to rely more and more on its computer resources. "We have gone from largely using computers to send out bills to running our business" with computers, he says. Today, computer systems do everything from monitoring UPS airplane engines to tracking packages worldwide. Under Erbrick's guidance, information services has grown from a group of less than 100 in 1985 to more than 700 now to meet these changing needs.

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CALENDAR

MARCH 31

IBM Information Technologies User Meeting. See Design, March 6-7 — Contact: IBM Information Technologies, 1200 N. T. Latham, N.Y. 12116.

Software Re-engineering Symposium. See Practices, March 6-8 — Contact: Digital Consulting & Writer, St. Andrew, Mass. 01855.

Video '99 Conference and Exposition. See Circ, Calif., March 6-8 — Contact: International Publishing Corp., P.O. Box 43373, Houston, Texas 77242.

Federal Office Systems Expo. **FOSS Software and FOSS Graphics.** Washington, D.C., March 6-8 — Contact: National Trade Productions, Suite 400, 2111 Eisenhower Ave., Alexandria, Va. 22314.

Annual Conventions of the Alpha Micro Users Society. Calif., March 6-10 — Contact: Alpha Micro Users Society, 735 Walnut St., Boulder, Colo. 80502.

Conference on ERP Performance/Capacity Management. Phoenix, March 6-10 — Contact: Applied Computer Research, P.O. Box 9350, Phoenix, Ariz. 85066.

IBM Conference on Artificial Intelligence Applications. Miami, March 6-10 — Contact: The IBM Computer Society, 1736 Massachusetts Ave., N.W., Washington, D.C. 20036.

CAD/CAM/CAE Strategy Workshops '89. Cambridge, Mass., March 7-8 — Contact: Duxbury, P.O. Box 418, 148 Park St., Cambridge, Mass. 02139.

Profiting From Micro-Officed Systems. Boston, March 7-8 — Contact: Lotus Software, Business Research Group, 333 Columbia Ave., Boston, Mass. 02116.

Public Conferences of the American National Standards Institute. Washington, D.C., March 7-8 — Contact: American National Standards Institute, 1439 Broadway, New York, N.Y. 10018.

MARCH 12-18

The Seventh National Conference on Monitoring State Processing Quality and Productivity. Orlando, Fla., March 12-17 — Contact: Quality America Inc., 7875 Dr. Phillips Blvd., Orlando, Fla. 32818.

Service Leadership in the 90s for Senior High-Tech Executives. Houston, Calif., March 16-17 — Contact: APTA International, Suite 315, 1342 Central Blvd., Ft. Myers, Fla. 33907.

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Carlos Cadalzo is president of Integrated Systems Technology, Inc., a 10-year old CICS consulting company that recently began marketing PC-based development tools for on-line systems.

The company created the Quick Screen 3270, a development tool that helps analysts design screens for CICS and IMS/DC systems — without requiring a programming background. The next step was to determine the best way to reach the buying market for this new tool. And for Carlos, the first option that came to mind was *Computerworld*.

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"The result was great news all around. I learned there is definitely a market for the Quick Screen 3270 — and that Computerworld Response Cards reach that market. I know this because we got 260 cards back right away. And four weeks later they were still coming in, which is also very impressive."

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COMPUTER INDUSTRY

INDUSTRY INSIGHT

Dennis Noonan

The emperor is really naked

Just about this time last year, a major computer company held a gala celebration to mark its entry into the billion-dollar annual revenue club. "Breaking through" was the theme of the day. Local employees were bussed on buses to a huge auditorium, where they were treated to a free lunch, free entertainment and a large dose of rah-rah.

The company was clearly doing well. Excess cash was burning holes in the coffers; the chief executive officer proudly confirmed to the crowd that the corporation was moving ahead with an announced plan to acquire another half-billion-dollar computer company.

Hardly anyone in that audience would have believed that more than 700 of their fellow employees — including the CEO — would be looking for new jobs within six months. And few would have predicted that the company itself would become

Continued on page 109

Sequent CEO maps out competitive plan

Strength lies in its price/performance ratio

BY ROBERT MORAN
OF STAFF

Sequent Computer Systems, Inc. intends to be a major player in the on-line transaction processing (OLTP) market, and Chairman and Chief Executive Officer Casey Powell is drawing a roadmap of the route the Benetton, Ore.-based company will take.

"We intend to blanket the market with a combination of direct sales and opportunistic OEM agreements," said Powell, who was on hand last week to discuss Sequent's newly announced OEM agreement with Unisys Corp.

The strategy is not new, especially for young hardware vendors that have floundered their companies on the economies of the

Unix operating system and have struck crucial strategic relations with vendors of relational database management systems. In Sequent's case, these RDBMSs are Relational Technology, Inc.'s Ingres and Oracle Corp.'s Oracle.

But the big differentiator is Sequent's price/performance ratio, which beats its competitors' by almost 50%, according to company claims. The combination of its Unix-based operating system, which is called Dynix and is compatible with AT&T's Unix System V and University of California at Berkeley's Unix 4.2, and its proprietary Symmetry architecture allows the concurrent operation of as many as 30 Intel Corp. 80386 CPUs for an aggregate power of up to 120 million instructions per second



Sequent's Powell

(MIPS). The systems range in price from approximately \$89,000 for an 8 MIPS system to \$1 million for a 120 MIPS system. Powell said that the company will offer a 150 MIPS system

by year's end.

According to Powell, "The inexpensive systems and marketing channels have paid off to date." For the year ended Dec. 31, 1988, the company reported \$76.1 million in revenue — a substantial leap over the \$38.5 million reported for 1987. Net income for the year was \$6.5 million.

In addition, the fourth quarter saw a decisive flourish, with revenue of \$24.2 million and a net income of \$2.3 million. Those numbers were boosted by the company's fourth-quarter catch of Reebok International Ltd., Tootle Roll Industries, Inc. and Apple Computer, Inc. Of the

Continued on page 108

User demands fueling network buyout fire

BY PATRICIA KEEFE
OF STAFF

An increasingly demanding user community is one of the major forces fueling a recent spate of buyout rumors that is stirring up activity in the computer industry's communications sector, according to analysts.

Some of the firms providing

grist for the rumor mill have been pegged as probable acquisition targets due to financial, product or marketing weaknesses. Others, however, while not necessarily large in size, are distinguished by stellar performances as niche players.

Perhaps most heavily affected by the ground swell is Digital Communications Associates,

Inc. (DCA) in Alpharetta, Ga. The TI and terminal-emulation product supplier has remained mum on reports that have the firm being sold in toto one day, the firm being sold in segments on another, and the subject of a leveraged buyout by former and current company officials the next. Both Siemens AG and Rockwell International Corp. are said to have offered \$30 a share for DCA, which was trading at \$20.75 per share at press time.

Analysts marvel at the volume of traded rumors almost as much as the amount of stock traded based on those rumors. DCA stock has come down from a trading high of 500,000 shares to about 200,000, one DCA in-

sider said. But most agree with longtime DCA watcher Mary McCarthy, an analyst at C. J. Lawrence, Morgan Grenfell, Inc. in New York, who said there is little doubt that the firm will be the subject of a major financial transaction sometime this year.

Analysts said they believe the same user needs that have spurred many mergers and acquisitions are also driving the heightened expectation for more such combinations. Users have become less willing to deal with a multiplicity of vendors, particularly when facing the task of integrating multivendor voice and data systems into seamless enterprise-wide networks. One result of such mounting impatience is a rise in user-based pressure on vendors to support competi-

Continued on page 104

Layoffs-plus as Unisys cuts costs

BY NELL MARGOLIS
OF STAFF

BLUE BELL, Pa. — Anyone who blinked last week probably missed one of the latest cost-cutting moves at Unisys Corp. First, the \$110 billion computer and electronics giant fielded an inventory reduction plan, then a voluntary retirement plan and finally a major work force reduction in an ongoing effort to keep expenses under control during a taxing product transition.

Some 1,700 U.S.-based Unisys jobs were eliminated last week in line with the company's plan to pare its employee roster by 3% by the end of this year, a Unisys spokesman said.

The nationwide reduction hit approximately 190 marketing, administration and engineering employees at Unisys' headquarters here, a company spokesman said.

As a result of the imminent consolidation of certain Rite Bell-based engineering and development operations with a similar, larger operation at Unisys' Roseville, Minn., plant, some 100 engineering jobs at headquarters were cut immediately, the spokesman said. Another 400 engineers will continue work through July.

The company also announced the impending closing of an assembly plant in Mexico, which

will cancel 400 jobs.

Earlier in the week, Unisys, which recently reported disappointing fourth-quarter earnings attributed to the costs of a major transition within one of its product lines, revealed plans for a voluntary retirement and so-called "voluntary layoff" program covering between 900 and 1,000 U.S.-based employees.

News travels fast

Word of the voluntary retirement plan followed closely on the heels of news that Unisys had launched a substantial inventory reduction program.

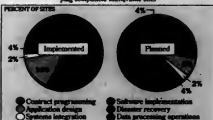
Analysts continued to applaud Unisys' cost-containment efforts and to evince at least guarded optimism with regard to the company's first chances of emerging from an expected weak first half of 1989 into a more robust third and fourth quarter.

Unisys, said Philip Fearnhead, an analyst at London-based Kleinwort Benson Securities, is fighting a less extreme version of the battle that is bettering Westwood, Mass.-based Culnet Software, Inc. "They're trying to maintain an old, low-growth business while simultaneously launching what amounts to a new start-up business," he said.

Data View

Service schedule

Contract programming is the most popular outside service used, but disaster recovery has become a major concern at IBM and plug-compatible mainframe sites



SOURCE: COMPUTER INTELLIGENCE
BY GARY FRANK, C. O'CONNELL

User demands

CONTINUED FROM PAGE 103

tern's equipment.

This, in turn, is forcing many vendors to become overnight experts or risk losing customers. These companies can launch time-consuming intensive research and development efforts to homebrew the required technology, strike strategic alliances with vendors that have the technology or, in an effort to maintain control, simply buy what they need.

"The vendors are all talking about doing internetworking, but they don't have the time to go out and reinvent the wheel, so there has to be some consolidation on the way," said Richard Kimball, an ana-

lyst at Montgomery Securities in San Francisco, following a recent visit to Communication Networks '89.

The impact of user pressure on the communications market was reflected in the alliance announced last week [CW, Feb. 20] between Network Systems Corp., Excelan, Inc. and Wellfleet Communications, Inc., all providers of different pieces of the connectivity puzzle.

The impact can also be seen in purchasing and marketing trends expected to further local-area network penetration of the corporate sector. For instance, a recent report issued by Boston-based Business Research Group noted a shift in focus among the leading personal computer LAN vendors from supplying traditional low-end PC networks to functioning as

network integrators.

In some instances, PC LAN vendors are lobbied by their limited recognition factor within MIS, which is increasingly taking control of LAN purchasing. "A large company's organizational networking strategy will require that the vendor be regarded as a credible, long-term player," the Boston Research Group said. Partnering with a large systems or even high-end communications vendor can change that.

It worked for Tops, a provider of low-end networking among MS-DOS, Apple Computer, Inc. and Unix PCs that is now a division of Sun Microsystems, Inc. General-purpose LAN vendor Ungermann-Bass, Inc. was also purchased last year, in this instance by fault-tolerant systems

maker Tandem Computers, Inc.

User pressure is unlikely to lessen this year. If the past year is any kind of precedent, this could well mean that the computer industry will see many connectivity vendors opting for the combination route in the coming months.

In addition to pressure from a more sophisticated and demanding user base, analysts find a very basic problem for communications combination. They estimate that only 18% of the installed base of PCs have been hooked up to a LAN.

Cullinet stands on shaky ground in third quarter

BY NELL MARGOLIS
CWI STAFF

WESTWOOD, Mass. — Cullinet Software, Inc. warned investors to expect a net loss for the company's third quarter. The numbers that emerged last week, however, exceeded its own worst expectations and left the faith of even formerly bullish analysts shaken on the subject of the speed — and even the possibility — of the wanted Cullinet turnaround.

Revenue of \$47.1 million for the quarter ended Jan. 31 marked a 13% drop from the \$54.2 million logged in the comparable quarter last year. The quarterly net loss of \$16.2 million, including a one-time \$5.6 million restructuring charge, made a stark comparison with last year's third-quarter net loss of \$12.7 million, which included a \$13.7 million nonrecurring charge.

In a prepared statement, Cullinet President Robert K. Weiler admitted that Cullinet underestimated how little it could depend on its more mature product lines — which include IDMS/R database-related products — to produce revenue over the past several months. However, he pointed out, "Revenue from products introduced in the last 12 months strengthened during the quarter."

Even so, analysts showed profound concern over this latest setback for the beleaguered software maker. "The numbers are ugly," said Bob Therrien, an analyst at Paine Webber, Inc.

The recent sorry performance, said Philip Fearnhead, an analyst at London-based Kleinwort Benson Securities, should not urge a rush to judgment on the executive ability of Weiler, who was recently named president of Cullinet. However, Fearnhead conceded, the failure of Cullinet's 11th consecutive quarter without profits to live up to the firm's whitened-down expectations "means that the turnaround that's been in progress for a long time is going to be in progress for a long time."

More disturbing is "the nasty risk that if they go on at this rate, they'll just run out of cash," added Fearnhead, who has been among those observers bullish on Cullinet.

Such a risk is not an immediate one, said Cullinet Vice-President and Chief Financial Officer Douglas Rabinstein. The company, he said, has a \$25 million line of bank credit, a small portion of which was exhausted as of the end of the third quarter.

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Buying Smart:

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Shoshana Zuboff, of the Harvard Business School and author of "In the Age of the Smart Machine: The Future of Work and Power" will open PERSPECTIVES 1989,

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Important topics to be explored include: Power Ties Effective Partnership with Top Management and The Customer as a Partner.

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COMPUTERWORLD

Court: States may tax net traffic

**On SQL
Server's
test trail**





Bruce Sobolov of CBS News, Laura Glaimond and Bruce Goldberg. AT&T, savor the afterglow of their own post-election victory. They take us behind the scenes for a glimpse at some of the reasons why CBS was successful on election night.

FEBRUARY 15, 1989

AT&T: Afterwards, the critics said CBS was the best, the fastest.

CBS: Right, but we sweated it out for more than a year. With more 20-hour days than I care to remember.

AT&T: Your situation was pretty complicated.

CBS: We were faced with election projections, exit-poll analysis, and other studio programming applications running on IBM hosts.

AT&T: Plus the NewStar system we tied in with our wide-area network, ISN. It's distributed networked computing. Hey, we thrive on this stuff.

CBS: We're impatient around here. Speed is the only way you succeed with election coverage. The first thing we did was provide multi-host access with the 6500 System. Last election, everybody who needed access to two systems used two terminals. Twice the space, twice the cable, additional controllers, added expense, and wasted time.

We had programmers working simultaneously on three host applications, two bisync, one SDLC. They were constantly skating between terminals, wearing ruts in the rug. Now they have access to multiple sessions simultaneously from one terminal.

AT&T: The data moves over twisted pair, the same type wiring the technicians pulled for your System 75 PBX. That made sense.

CBS: An added advantage was having the same dedicated AT&T technicians installing and maintaining our system, providing consistency to my operation.

AT&T: But really Bruce, why us?

CBS: Your responsiveness. At

custom host software we always used. We greatly reduced our cost.

AT&T: The other networks are watching, thinking, "How come CBS has the results already and we don't?"

CBS: It was a good night for us. Now the name of the game is streamlining for 1990. We're talking about a networked computer solution as a gateway into different host systems.

AT&T: With the AT&T Systems already up, running, and in place, we can almost completely automate your survey system.

CBS: That's a real big plus for all of us.

AT&T: Something tells me I've seen that same glint in your eye before. (Laughter)

Skating between terminals put ruts in the rug.

CBS, we all agreed that what we needed was someone who could deliver it fast, install it, test it, and support it. And you were hungry. You never said, "No, we can't do it." And you never took long to say "yes."

AT&T: You had computer networking problems. Solving them is the house specialty.

CBS: We do distributed computing to the nth degree. Our reporters are all over the country. They call in their results when the precinct closes. Before, we had over a hundred operators standing by, with phones and terminals. That election night we introduced the voice response system running on AT&T PCs.

AT&T: How many calls?

CBS: Thirty, thirty-two calls at once, reporters everywhere having voice response conversations with the IBM host. And all done with the same

The CBS Solution:

THE CHALLENGE:

Integrate IBM and DEC host computers and NewStar editorial system. Build an advanced computerized voice response system to speed election-night projections.

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THE RESULT:

CBS News provided fast, accurate election coverage throughout Campaign '88. The *Baltimore Sun* reported that, "CBS was recording results in all sorts of key races faster and with far more authority than either of the other networks."

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IN BRIEF

Small is big, again

Shanghai-Fujitsu Co. credits a 7.3% increase in net income and a 21% increase due to orders for workstations and personal computers coming on strong in its fiscal first quarter.

Accelerated growth in orders for the machine HP Precision Architecture system, according to President John Young, also ticked into the Palo Alto, Calif.-based computer manufacturer's reported net income of \$193 million on revenues of \$2.7 billion for the quarter ended Jan. 31.

Consortium offspring

The Shogun Consortium Ltd., a 55-member, non-profit group formed to boost Matsushita, Inc.'s 20000 reduced instruction set computing microprocessor architecture, last week announced an offshoot: The Software Initiative, a gathering of software vendors that have pledged to deliver new 80000-based applications this year.

The initial roster of company members include Westpac Corp., The Westpac Group and database makers International Technology, Inc., Unity Corp. and In-Sync Corp.

Looking presidential

Shug Corp. voters Ken Kesel last week became president of Palo Alto, Calif.-based Shug Microsystems Co., the division of the Japanese giant's U.S. subsidiary that markets Shug's Nexus family of workstations.

Strengthening the NetWare

Puller Computer, Inc. withdrew yet another offering of an extended NetWare kit to do a full upgrading of the operating system, which is the latest in a series of products designed to strengthen the NetWare operating system.

Sequent CEO
FROM PAGE 103

fourth-quarter systems shipped, 65% were to first-time buyers, Powell said.

Despite such promising direct sales results, the company is still charting an OEM course. As recently as last week, it struck a deal with Unisys, which will add

peripherals and market the Sequent systems as its own. Sequent said it anticipates that the agreement, which covers three years and contains two optional one-year extensions, will generate about \$10 million in 1989 and another \$240 million for the following years.

This particular OEM deal promises to generate more sales. An OEM alliance with Sie-

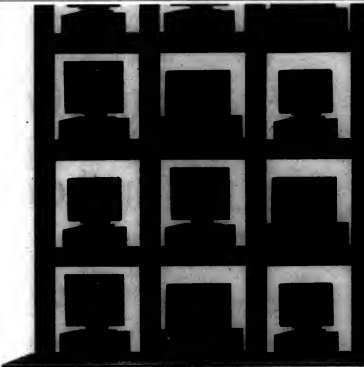
mens AG in February 1986 changed the face of the company.

Six years ago, Sequent entered the scientific and technical marketplace, which now generates about 20% of its business. But through the OEM agreement, Siemens brought Sequent's older Balance series, which is based on a National Semiconductor, Inc. 32032 pro-

cessor, to the OLTP market throughout Europe.

Today, about 80% of the company's sales come from the commercial marketplace, Powell said — specifically, to those companies that need the combination of departmental machines and RDBMSs.

"We're in the fishing business," Powell said. "We thought we had a good fishing pole. Sie-



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mens said that we had a good spear."

Whether with a fishing pole or spear, Sequent hopes to net an even more elusive catch from a joint-venture firm formed in December with Matsushita Electric Industrial Co. in Japan. Called Pana-Sequent, the company will cast its net throughout Japan, particularly to earmark office automation customers.

The joint venture has its subtle side. Although Sequent looks to penetrate the commercial market in Japan, it currently has about 50 systems installed, primarily in the university market. The Pana-Sequent venture, Powell said, positions the firm to defend against continuing shortfalls in memory components and take advantage of Matsushita's developments in optical storage.

Noonan

FROM PAGE 103

the target of a hostile takeover from yet another corporate raider.

Last month, not quite a year after that magic moment, the new CEO announced that the company plans to lay off another 1,200 workers in an effort to

get leaner and meaner.

Maybe the accountants and financial analysts think that the original takeover deal still looks great on paper. But I'm skeptical: I think all this takeover activity is a bad idea.

A company is more than totals on a balance sheet or a slice of market share on a pie graph. The company is really the people — the living ideas and relation-

ships that make things work the way they do.

Companies are the first to acknowledge this, at least verbally, but actions speak louder than words. High-level corporate takeover decisions seem to forget that the worth of an organization goes far beyond the last quarterly earnings figures.

Shrinking violets

I think part of the problem is that there are not enough people around who are willing to say, "Maybe this isn't such a good idea." Like the courtiers in the fable *The Emperor's New Clothes*, no one with any brains wants to be the bearer of disagreeable tidings. Can you imagine someone raising a hand at the annual meeting to ask, "Haven't the company gotten big enough?"

Descent in business is as welcome as a shunk at a levee party. All the fine lingo of academics notwithstanding, managers in a hierarchy succeed by saying, "Yes, sir." Successful people do not question their boss. Asking questions is seen as cynicism or even disloyalty.

Those who blindly assent to whatever the boss thinks are seen as being on the side of goodness and light. Anyone who is foolish enough to question the growth goals of a successful empire gets the same treatment as the idiot who yells, "Hey, the emperor is naked!" at a state parade.

Times are a-changin'

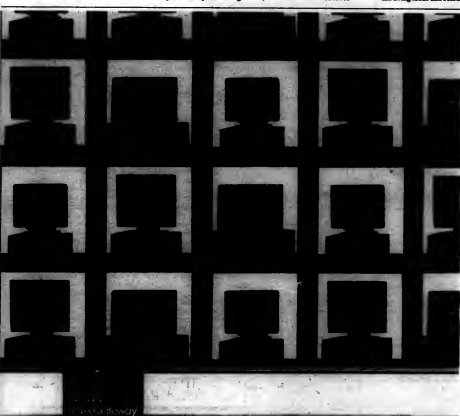
But maybe things are changing. According to a recent news report, General Motors has publicly begun to question the effectiveness of its authoritarian management style.

The motivation to change is said to be Ford Motor's earnings success. A few years ago, Ford, looking for a strategic edge, adopted a program to focus on community and teamwork, the article said. It seems to have paid off.

If Ford and GM are on the right track, maybe communications consultants will start advising companies to do a lot more listening to their employees, especially the so-called cynics. Beware of the carpetbaggers who have no stake in the success of the company. Listen to and reward the people who show enough interest to ask tough questions and propose alternatives.

But if you work for one of those companies where management thinks that it needs to keep expanding the empire, maybe you should discreetly find what the boss will be wearing to next year's kickoff meeting.

Noonan is a free-lance writer based in Wellesley, Mass. He was formerly a project manager at a minicomputer maker in the Boston area.



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COMPUTER CAREERS

Pick holds future promise

The technology is popular with professionals and growing on management

BY SHERYL KAY
SPECIAL TO C/W



In today's competitive environment, where getting critical information to top executives is a timely fashion is crucial, it makes sense to master technologies that can expedite the information flow. Pick, the operating system developed by Dick Pick in the late 1960s, is such a technology.

Pick Systems, based in Irvine, Calif., has licensed the operating system and its Pick-Basic language to several firms that produce their own versions. Similarities among the versions far outweigh the differences, and they are making mastery of Pick and Pick-Basic a sound career choice for the 1990s.

Pick is a multitier operating system known for the ease with which it lends itself to development of applications and reports. One significant drawback, however, is a lack of communications capabilities.

By the middle of last year, there were about 130,000 mainframe and minicomputer Pick in stations worldwide and about 80,000 installations of the personal computer version, which has been available since 1984.

According to Steve Crews, vice-president and general manager at Pick,

Sales of Pick operating systems by licensees grew 41% per year between 1982 and 1987, the last year for which figures are available, according to Dick Ness Jr., a senior analyst at market research firm Infocorp, in Santa Clara, Calif.

"We expect the Pick market to continue to exceed the industry growth rate for several years to come," Ness says. The proportion stems in part from the portability of Pick applications across hardware environments and the number of value-added readers writing software for Pick, he says.

Demand at all-time high Demand for Pick professionals is at an all-time high, says Crews, adding that Pick Systems has started getting requests for help in filling positions, including a significant number in Australia and the UK.

"It's getting more difficult to hire guys for our own R&D lab," Crews says. "Normally, if they've got a very strong Pick background, they're making good money, and there's a lot of competition out there that want to hire them."

"We worked in Cobol, Pascal, Fortran and assembler,"

says Kevin Shaw, MIS director at Deenik Trading Post, Inc., a clothing retailer in Peabody, Mass. "Pick-Basic has the best from all of these systems in terms of functionality and power."

Shaw, whose company is running Ultimate Corp.'s version of Pick on a Bull H.N. Information

PICK GIVES ME a very appropriate outlet for my creative impulses."

RICHARD CANTY
CORNUINUS

Systems DPS 6, finds that many professionals are attracted to the Pick world because the technology allows them to work rapidly. An entire system, including I/O and update, can be completed in a week. "When I show people who have IBM or DEC operating systems what we've done in a week, they are just taken aback," he says.

With eight years of professional data processing experience, Richard Canty, a senior programmer analyst at Cornutus, Inc. in Oakland, Calif., has worked with many Pick-like systems. He has also spent eight

months coding Unix C programs. It requires a great deal more time for programmers to get Unix to accept an application, he says.

Canty, a published poet, adds that Pick provides a flexible environment that fosters creative programming. "Pick gives me a very appropriate outlet for my creative impulses," he says.

With the time saved by using Pick, programmer/analysts can broaden their perspectives, says Bob Dedecker, vice-president of products and services at Gemini, a division of LCS, Inc. in Lakewood, Colo.

"It's no longer sufficient just to code lines in a program," Dedecker says. "My people like Pick because they can spend less time generating programs and more time learning our business."

Although most Pick shops will hire professionals proficient in other languages, they would prefer to hire experienced Pick people. "I don't want someone with experience because he will understand the nuances of Pick — what you can do easily and what can't be done easily," says Dick Gower, director of computer operations at Century 21 Real Estate Corp. in Irvine, Calif.

Stick-to-itiveness

While he hopes to stick with Pick for the rest of his career, Cornutus' Canty advises professionals who are well-versed in the system to learn Unix as well.

"There appears to be an emerging option to merge the two where they are co-residing operating systems," he says. This symbiotic relationship draws on the best aspects of the two operating systems, including Pick's ease of use and the communications capabilities of Unix.

Experienced Pick professionals earn average to above-average salaries, with three years of experience commanding \$30,000 to \$35,000 a year. Systems analysts and project leaders with five to seven years of Pick experience are earning \$40,000 to \$50,000 a year.

Although such compensation may seem generous, firms using Pick save money because they do not need as many people to run the shop. "In your typical IBM environment, you need quite a few people in there just because the system requires so much hands-on work," Shaw says. "Pick is a great way for some people to experience being the manager of a shop or at least in control of several major corporate systems because we don't need as many people to develop and run Pick systems."

Century 21's Gower jokingly urges caution in choosing Pick as a career option. "Once you get into it, you will never want to leave and go back to anything else," he says.

Kay is Tampa, Fla.-based business consultant and free-lance writer specializing in emerging technology and business resources.

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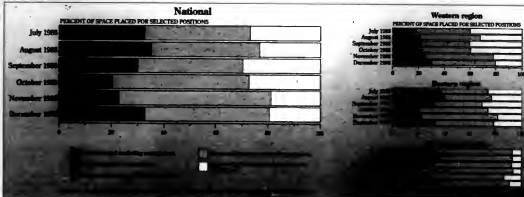
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TRAINING

The false allure of Hypercard

The capabilities are appealing, but the effort may not be worth your while

BY JANE STEIN
SPECIAL TO CIO

Bullied by relentless hype and exaggerated claims, many otherwise reasonable people have jumped to premature conclusions about the ability of Apple Computer, Inc.'s Hypercard to improve computer-based training (CBT) and streamline its development. Now, however, the product has been in enough hands for sufficient time so that its pros and cons as a real-world authoring tool have become more clear.

Can you develop CBT with Hypercard? Certainly. Can you develop CBT for teaching computer skills? Well, sort of.

Even if there were enough Apple Macintoshes in the business world to make them a practical option for training delivery — and everyone knew how to use them — Hypercard almost certainly would not be the medium of choice for developing traditional CBT for computer skills.

The Macintosh's graphics capabilities do make it possible — although not necessarily easy — to construct screen simulations for many applications, according to Richard Fuchs, a programmer at consulting firm First Reference, Inc. in New York.

But Hypercard cannot read keystroke-per-keystroke input, limiting its usefulness for simulations.

It cannot process anything but a multiple-choice question. It cannot do natural-language parsing — “answer analysis” in CBT terminology.

So even in foregoing practice exercises and sticking to conceptual lessons, users run up against a major handicap.

Further flaws

Hypercard has other shortcomings that make it a questionable choice for projects of any size or complexity. One of its open secrets is its slow execution.

“Where Hypercard really bites you in the butt is in testing,” contends Lance Dublin, president of The Training Co. in San Francisco, which has done custom development with the product.

Hypercard has been described as a relational database for ideas, yet it lacks some of the basic features any database administrator would consider essential. It has no built-in global search-and-replace function, although file utility software might do that job.

To link all occurrences of a particular keyword to a corresponding glossary card, for example, the user must walk through the whole construction, inserting the “buttons,” or links, one by one.

The program does not contain — and no one has apparent-

ly yet come up with — a way to edit the button structure. There is no Hypercard equivalent to the CBT authoring system's method of checking dead-end branches.

The glory of Hypercard is that it lets you easily construct vast networks of interlocking cross-references. But the program cannot show you an outline of your work.

There are solutions to some

education at the University of Colorado in Denver, is assembling a library of public domain instructional stacks under the auspices of the Association for Educational Communications and Technology.

Does it make sense to spend so much time and energy applying patches and force-fitting Hypercard to do all those things we take for granted from most of the myriad CBT authoring systems available?

It is a natural instinct when confronted with such a wily new tool to see first whether it is better, faster or cheaper at doing old tasks. In this case, it is not.

DOES IT MAKE sense to spend so much time and energy applying patches and force-fitting Hypercard to do all those things we take for granted from most of the myriad CBT authoring systems available?

Of these problems, of course. Making liberal use of Hypercard's programming language Hypertalk and calls to external programs and subroutines, the canny author can hand-build some basic CBT functions into the application.

Hypercard's irresistible appeal to hackers has led them to inundate bulletin boards with scripts, stacks and calls to external programming. First Reference sells a package of templates and subroutines for CBT development.

Scott Grabinger, professor of

For most data processing and information systems training applications, it is clunkier, slower and ultimately more expensive.

However, for those developers who have come up hard against the inadequacies of traditional CBT and want to explore new approaches, Hypercard is worth considering. It is almost ideal for small-scale, quick-and-dirty training projects of the sort that derive from the occasional need to update people on some new regulation, concept, feature, system fix or the like. Anyone with basic Hypercard com-

petence can throw together a short module in less time than it takes just to get the local CBT authoring expert's attention.

For constructing an essentially noninteractive “guided tour” of the training center, the department or company personnel policies, Hypercard might also be the weapon of choice.

Beet it into submission

If you can wrestle the auxiliary programming into place and are willing to live with the editing and maintenance hassles, Hypercard will give you the basis for a hypermedia system that does much more interesting things with branching and graphics — and does them more easily — than most CBT authoring tools.

But the reason that linear CBT is so dominant is the prohibitive length of time it takes to design anything more elaborate. Even in an established CBT shop, up-front design work eats up the lion's share of time and costs.

“The world's most wonderful authoring tool might knock a third out of your authoring cost, but it is not going to do a thing for your development cost,” said Rob Foshee, director of quality assurance standards at Applied Learning in Naperville, Ill.

“The false allure of Hypercard and Hypercard,” Dublin says, “is that you can do great training easy.”

Stein is a free-lance writer based in Arlington, Mass., and is a former editor of Data Training and CBT Directions.

Computerworld Marketplace/Training Editorial Schedule 1989

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- March 13th - Evaluating training software
- March 20th - Educating management about using computers
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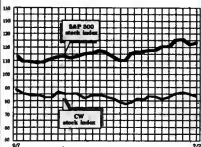
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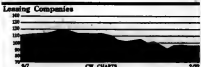
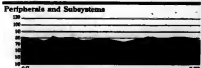
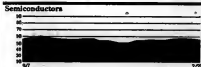
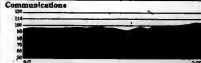
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STOCK TRADING INDEX



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Semiconductors	57.7	56.5
Peripherals & Subsystems	80.0	77.9
Leasing Companies	94.2	94.6
Composite Index	85.4	84.4
S&P 500 Index	123.0	124.8



Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, FEB. 22, 1966

ECONOMY	PRICE			
	83-84 FARM (1)	CLOSE FEB. 23 1984	WEEK NET (2)	WEEK PCT (3)

Communications and Network Services

[illegible]

Computer Systems

[illegible]

Software & DP Services

[illegible]

Semiconductors

N	ADV MICRO DEVICES INC	17	7	0.8500	-0.1	-1.4
N	AMCON DEVICES INC	10	10	13	0.0	0.0
N	AMALCO CORP	10	10	0.8750	0.0	0.0
N	CHIPS & TECHNOLOGIES INC	21	11	17	-1.0	-0.0
N	INTSL CORP	37	10	20.20	-1.0	-0.0
N	CENTRIC CORP	14	0	10.8750	0.0	-0.4
N	NUCKEN TECHNOLOGY INC	30	10	19.8750	1.0	7.0
N	INFOTRAX INC	10	0	42	-1.0	-4.0
N	WFL BOWCHUCKER	10	1	0.1	-0.1	0.0
N	TEXACO BAKING INC	07	30	41.1250	-1.0	-3.0
N	WESTERN CAPITAL CORP	10	10	13.6250	-0.4	-3.0

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Leasing Companies

Q	AMPLICON INC	20	10	10	-0.4	-1.0
	CAPITAL ASSOCIATES INT'L					
	INTERCINE INC	7	4	0.025	0.0	2.0
R	CONCORD INC	20	10	20.75	-0.8	-3.1
	CONTINENTAL INFO SYS	8	0	0.0	-0.1	-11.0
	CRS INFORMATION	10	10	10.75	1.0	7.0
O	PHYSICS ANAL INC	0	0	0.020	0.1	2.0
	MUSICAL INC	7	0	0.375	0.1	2.0

Meltdown

Midwinter meanderings lead shares to a seasonal slump

The annual case of the blaise that tends to make the rounds of offices, schools and other gathering places as February melts into March visited the technology corner of the stock market last week. IBM, which slipped 4 1/2 of a point to start the week at \$125.44, dropped another 1 1/2 points to close Thursday at \$123.94. Digital Equipment Corp., last seen bouncing back from a six-month slump, fell 5 1/2 of a point to close Thursday at \$114.44. Hewlett-Packard Co.'s equity investment in 3Com Corp. boosted \$30M of a point to close Thursday at \$72. Neither that deal nor a better earnings announcement kept HP from a 4 1/2-point fall to \$6.54 at the week's end.

Cullinet Software, Inc., already losing ground as it warned of its 11th consecutive quarterly net loss, dropped further after announcing the actual numbers. Cullinet closed Thursday at 5 1/4, down 1/4 of a point.

A spring-like note in the winter landscape was struck, however, by Data General Corp. Previews of its big RISC gamble, a Motorola, Inc. 88000-powered workstation series, piqued interest in the much-battered mini-computer maker; Data General stock climbed 3/4 of a point to end the week at 19 1/4.

changed 74 in a point to end the week at 194.

WILL MARGOLIS

Five join in low-cost Unix effort

BY WILLIAM BRANDEL
OF NEW YORK

Marking Unix's 20th anniversary, five leading workstation software vendors will launch a fully loaded, low-cost Unix software package for Intel Corp. 80386-based systems to undercut comparable offerings from the company that made Unix popular—Sun Microsystems, Inc.

Digital Equipment Corp., The Santa Cruz Operation (SCO), Relational Technology, Inc., Tandy Corp. and Lucas Computing Corp. reportedly plan to make their announcement tomorrow at Uniform 1989 in San Francisco. The package will be called Open Desktop, sources briefed on the event said.

The package will include a 386-based system from Tandy; DEC's application programming interface, XUI; SCO's latest version of AT&T's Unix System V, Release 3.2; Relational Technology's DBMS/386; and Lucas' Merg.

Excluding the Tandy machine, the package's license will cost \$995 for two users and an additional \$500 for an upgrade to support three or more users, sources said.

Shaking contributions

A DEC spokesman confirmed the arrangement, stating that DEC would not be offering the package but will offer its XUI as a technological contribution.

The companies are merging their product offerings in an effort to standardize personal computer software for 386-based systems.

In addition to the products listed, the package will support industry standards including X Window System, Sun's Network File System, Transmission Control Protocol/Internet Protocol and the Open Software Foundation's standard user interface when it becomes available.

"Sounds like a damned good deal to me," said Tim Rudolph, senior systems engineer at Hanes Air Force Base in Bedford, Mass. "The price-point is intriguing. If I had \$10,000, I'd buy one myself."

Sources said the package is being targeted at the government and academic markets. The software will run on any 386-based PC and will require a 100MB-byte hard disk and at least 640 bytes of memory. The package's total cost will be approximately \$9,000. A comparable system from Sun would reportedly range in price from \$15,000 to \$20,000.

IBM's 'open' vow questionable

ANALYSIS

BY AMY CURTISE
OF NEW YORK

A year after IBM placed its AIX on a pedestal next to Systems Application Architecture (SAA), questions regarding the equality of the two product lines still abound.

Since modifying its long-held proprietary views and officially sanctifying its version of Unix as a strategic product at Uniform 1988, IBM has gone to great lengths to prove it is serious about Unix and open systems. The marketing giant created a division dedicated to AIX and was its biggest endorsement from the Open Software Foundation, which will have its candidate for an industry-standard Unix operating system in AIX.

On the downside, IBM's disclosure earlier this month that it will be late with AIX/370, signaled possible troubles in bringing AIX to the mainframe. His RTI workstation has yet to command any respect in the market.

While some observers say IBM will be a success in the Unix world simply because it is IBM, others are not so sure.

IBM has gone to great lengths to prove its commitment to Unix, but many still call it a shotgun wedding. "Proprietary systems will always be IBM's systems of choice," commented Bob Djurdjevic, president of Arcnet Research in Phoenix, Ariz.

For IBM, "Unix is a choice of necessity," he said. Necessity or not, many insist IBM will be a force to be reckoned with.

"IBM will be quite a major player in the Unix market," said Judith Harwitz, senior editor at Patricia Seybold's Office Computing Group in Boston. Harwitz cited the commercial appeal of AIX features such as disk mirroring and— even more important — the marketing clout of IBM. "While other vendors will have to beg and plead with software developers to port applications," she said, "everyone will be writing for AIX."

Harwitz said she foresees AIX playing an interesting role for IBM. While IBM is constrained by the specifications of SAA and the need to remain compatible with older systems, there are no precedents for AIX. Therefore, IBM is free to experiment and bring new technology into AIX, she said. However, AIX will have to stick to standards designated by X/Open Consortium Ltd. and other standards bodies.

A unified AIX family spanning operations from the desktop to the mainframe is at the core of IBM's AIX strategy. However, most analysts downplayed the significance of IBM's postponed mainframe AIX offering.

While analysts debate the potential demand for mainframe Unix, AIX/370 is a real consideration for some customers. Carl Bond, vice-president of informa-

tion systems at Farn Bureau Mutual Insurance of Chicago, has installed IBM RTs at all of his insurance agencies and plans to eventually link them to a central processing system possibly an IBM mainframe running AIX. So far, he said, he is satisfied with AIX and indications of IBM's continued commitment.

WHILE SOME observers say IBM will be a success in the Unix world simply because it is IBM, others are not so sure.

Harwitz said she does not think that IBM's delay of AIX/370 signals major problems. Since AIX was developed for the RT, there are many changes required to port it to the mainframe. "IBM has leverage no one else has — they can afford to be a few months late," she said. "For another company, that would be disastrous."

David Carl, an analyst at Framingham Mass.-based market research firm International Data Corp., suggested that AIX/370 was delayed because it was not a priority for IBM. "There is not much demand for AIX/370. It is really a low-end market right now," he said.

However, Djurdjevic argued

that the opportunity cost for IBM will be significant. Amdahl already has a foothold in the mainframe Unix market, and Unix is helping the IBM-compatible vendor sell mainframes, especially in Europe, he said.

Amdahl Corp.'s latest release of UTS, its version of Unix, is the first to offer third-quarter availability. Unlike AIX, which runs as a guest operating system under VM, UTS runs natively and therefore achieves better performance.

Djurdjevic contended that there is more at issue for IBM than Unix. Unix is a new application area for the 9370, and IBM was counting on that to spark sales of the midrange mainframe, he said.

At the time, IBM's biggest challenge may be to provide a powerful family of workstations. RT enhancements are slated for this year, but a significantly improved follow-on is anticipated in 1990 or 1991.

John Logan, vice-president at market research firm Aberdeen Group in Cambridge, Mass., does not see IBM becoming a major Unix player. While he said he views AIX as a "world-class product," the problem is not the implementation but IBM's hardware platforms and lack of corporate-wide commitment to AIX. Comparing IBM's RT success to AIX, he said, "It looks like IBM will be a follower in all cases."

As Logan summed it up, "The final crucial irony may be that AIX succeeds in the form of OSF, but ends with little market presence in its own name."

Unisys U series casts shadow in Unix arena

BY ROBERT MORAN
OF NEW YORK

In the midst of layoffs last week, Unisys Corp. broadened its Unix-based offerings with three new models in its midrange U series. Analysts viewed the announcement — together with the formation of a Unisys Network Computing Group (NCG) and the bundling of its systems as X/Open compatible — as the company's signal that it will become a major force in the commercial Unix market.

Unisys now offers Unix-based systems that span the gap from the desktop to multiprocessors. The X/Open bundling course that the systems will comply with the Common Applications Environment specified by the X/Open Consortium Ltd.

"Unisys has quietly become a formidable player in the Unix market through its OEM strategy," said Peter Kattner, vice-president of Aberdeen Group, a

market research firm in Boston. "They can now address anybody's requirements at a competitive price."

Unisys' largest growth area has been its Unix-based systems, said Robert Cameron, an analyst at Datatech, Inc. in Roxboro, Mass. "By creating the Network Computing Group, Unisys has isolated its best performers into one successful group." The tactic, he said, "adventurously points out the company's other lines of business."

Indeed, while touting the \$800 million in revenue that the company garnered from Unix last year, Paul Ely, president of the new group, said that company-wide layoffs (see story page 103) will affect the NCG. Although Ely would not be specific, he said the layoffs would be less severe within the new organization.

The two largest models, the U 6000/70 and the U 6000/80, come to Unisys through an OEM

arrangement with Sequent Computer Systems, Inc. in Beaverton, Ore. Slated to become available in July, the U 6000/70 will cost from \$110,000 to \$400,000. The U 6000/80 will cost from \$195,000 to \$1 million and will support up to 400 users.

The entry-level U 6000/50 was built by Convergent Technology, Inc., now a Unisys division following its acquisition in December. The U 6000/30 supports up to 16 users. Available immediately, its price ranges from \$11,000 to \$30,000.

The new models, together with the company's older U 6000/50, are based on Intel Corp.'s 80386 processors and run software based on AT&T's Unix System V and MS-DOS.

From here to there

Clifford Rushton, manager of data processing at the forest products division of the Federal Paper Board Co. in Augusta, Ga., has ordered 20 U 6000/30s.

Already a user of the U 6000/50, Rushton will place the new models at remote sites. "With the systems, we will be able to distribute processing to local sites and upload data to the main office without worrying

about applications portability," he said.

He added that the high-speed processors give him confidence that he will not be dead-ended in the midrange. Furthermore, he said, because of MS-DOS, microcomputer users in distributed sites can use their own programs and share files, almost like using a local-area network.

Unisys also introduced Decnet Interconnect, a software package that allows midrange processors to connect to Digital Equipment Corp.'s proprietary Decnet network. Set to be available between April and June, prices for the systems will range from \$2,000 to \$8,000.

Unisys added IBM Token Ring capability to its PCI software, which allows IBM Personal Computers and compatibles running MS-DOS to share files, applications and resources with a central file repository maintained on a Unix processor. Slated to be available in April, prices will range from \$950 to \$5,500.

Unisys also announced that U series processors can now run Sun Microsystems, Inc.'s Network File System, which will range from \$3,500 to \$9,000.

Sun heats up Sparc strategy

Low- and high-end workstations bolster Sun's line to counter DEC threat

BY JULIE PITTA
CHICAGO

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc., will have a double-barreled response to the increasingly competitive reduced instruction set computing (RISC) arena this week with low-end and high-end workstations, according to sources briefed on the products.

Sun will introduce a workstation based on its Scalable Processor Architecture (Sparc) running at 8 million instructions per second (MIPS) and priced at about \$7,000, the sources said. At the same time, Sun will unveil a high-end Sparc-based system offering 20 MIPS in processing speed. That system will be priced at about \$30,000.

A Wall Street analyst briefed on Sun's offerings said the firm is looking to pepper its installed base with front-end units. "Sun

can go back into those sites and then sell them a high-end server with a beefy price tag," he said. Sun is expected to show both systems privately to selected customers at the Uniform 1989 show in San Francisco. Company officials declined to comment on the systems.

RISC rivals
Industry watchers said the barrage of products is Sun's response to heated competition in the workstation market, especially the emergence of RISC-based systems from competitors such as Digital Equipment Corp. Additionally, Sun will bolster its Motorola, Inc. processor-based line of workstations later this spring with a 68030-based system that costs about \$6,000, sources said.

An existing system in the Sparc line, the Sun-4/110, costs \$19,950 and runs at 7 MIPS.

The rollout of a low-end system will likely require that Sun make price adjustments.

Meanwhile, Sun is developing a Sparc system with a processing speed of between 40 and 50 MIPS, the sources said. That system, which will require a cool environment to operate, is expected to be unveiled before the end of this year, they added.

According to industry watchers, Sun is looking to pull away from DEC, which passed Apollo Computer, Inc. to become No. 2 in the workstation market last year.

"When Sun turns around, it's looking at DEC," said Jennifer Johnson, senior analyst of the technical market at Framingham, Mass.-based market research firm International Data Corp. "It's true that DEC has just introduced its first RISC machine, but it's clear they intend to fill out their line."

prediction depended on Motorola's chip being accepted as the RISC architecture for Apple Computer, Inc.'s hardware. "If not, they'd end up a rather distant third," she said.

Eyes peeled

The consortium is eyeing the shrink-wrapped Unix software market for Motorola RISC computers, much like the current market for off-the-shelf MS-DOS software for personal computers, Cady said.

"We'll use Open Software Foundation standards as appropriate," said Bob Anderson, executive director of 88open.

The consortium has developed BSC for Motorola's chips and has worked with AT&T to develop a Unix application binary interface, according to Ed Staino, executive vice-president of Motorola.

The consortium's technical staff, Anderson explained, audits software compliance to its standards and will issue its seal of approval for software that passes the certification program.

1989, although DG and Sanyo are announcing hardware products that are expected this summer (see story page 3).

Motorola is leveraging its RISC architecture through the consortium, while RISC rivals Sun Microsystems, Inc. and Mips Computer Systems, Inc. are using more informal software development channels — Sun through third parties and Mips through an independent software company that serves as an intermediary for third-party developers.

Roger Cady, director of 88open, said that Motorola is expected to be far ahead of Sun and Mips in market share by 1993, according to research conducted by Santa Clara, Calif.-based Infocorp.

However, Infocorp analyst Jeanette Sil-Holmes said that

Data General

CONTINUED FROM PAGE 1

family of microcomputers erodes.

"This is their future," said July Harwitz, a senior analyst at Patricia Seybold's Office Computing Group, a market research firm in Boston. "This is DG's first step toward a comprehensive switch-over to a full Unix strategy. They're essentially building a new company from within."

The entry-level workstation is reportedly based on a 16-MHz 88000 chip and is capable of pro-

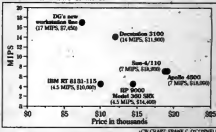
cessing, an analyst at Duff & Phelps Secured Utilities, Inc., a market research firm in Chicago.

One factor assuring this will be the machine's adherence to the 88open Consortium Ltd.'s binary compatibility standard (BCS). The BCS calls for all software written for any 88000-based computer to employ a common interface to executable or binary programs, thus allowing for compatibility across systems from many vendors.

Commercial users of the new line, including those in the financial, manufacturing, government and health care fields, will likely

One-upmanship

In the battle to deliver the most MIPS for the fewest dollars, DG's announcement this week should top DEC's price/performance benchmark established last month



cessing more than 17 MIPS. It will offer 4M bytes of memory, expandable to 28M bytes; a monochrome 20-in. 70-Hz monitor reporting 1,280-by-1,024-pixel resolution; and built-in Ethernet and local computer systems interface capabilities, sources said.

The machine will be available this summer starting at \$7,450; qualified developers will be able to obtain a model in the spring for \$4,900. A color version of the same system with 8M bytes of memory and a 19-in. screen will cost \$11,995.

A higher performance model featuring Motorola's 20-MHz 88000 chip and 8M bytes of memory will sell for \$10,850. A similar version with a color monitor will begin at \$14,995. All the machines will be able to run DOS and Unix.

The company's most Sanyo task is likely to be in establishing itself in the Unix market, in which companies like NCR Corp. and Bull H.N. Information Systems, Inc. enjoy large user bases. DG's machines will run DG/UX, its implementation of AT&T's Unix System V.

The early bird

DG will reportedly make a big push to get the machines into the hands of software developers so that applications can be ported to the new line. Analysts see this as key in helping DG establish a foothold in the market and secure new customers. "You can't sell a machine if you can't do anything with it," said P. Martin

needing high-performance machines on their desktops.

Early assessors of the machines say they were impressed with the RISC technology at the low price. "We can't wait to get one," said Al Rocco, a systems manager at Westwood, Mass.-based Medical Information Technology, Inc., which has a network of 400 terminals attached to nine DG microcomputers. "Our network went down as we add more terminals; the RISC machine should take care of that."

But some analysts say that lack of volume production of Motorola's chips may slow DG's ability to make a quick drive into the market. "It's skeptical that they can make much of this because there aren't a lot of 88000 chip sets around to put the machines into volume production," said John J. McManus, vice-president of Thomson McGraw-Hill Securities, Inc. in New York.

DG is also scheduled to introduce single- and dual-processor servers. The entry-level single-processor line will include 16M bytes of memory, offer 20 MIPS of processing power and sell for \$59,000. A dual-processor model will start at \$94,000.

DG's rollout will be the pacesetter in the batch of recent announcements featuring the Motorola chip, which was announced last April [CW, April 25]. Last week, Sanyo Business Systems Corp. and Icon International, Inc. announced the Model 8800, which boasts 15 MIPS of performance and will reportedly be available this summer for \$155,000.

RISC software gets 88open thumbs-up

BY J. A. SAVAGE
CHICAGO

BURLINGAME, Calif. — A 29-member consortium organized last year to promote Motorola, Inc.'s reduced instruction set computing (RISC) architecture announced 28 software packages last week to accompany the first RISC-based hardware products from Data General Corp., Sanyo Business Systems Corp. and Icon International, Inc.

Promoting rigorous enforcement of its binary compatibility standard (BCS), 88open Consortium Ltd. has placed its seal of approval on the products, which range from operating systems (including Pick Systems' Pick) to compilers, relational databases and office automation.

Nearly all the products are scheduled for availability in late

1989, although DG and Sanyo are announcing hardware products that are expected this summer (see story page 1).

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TRENDS

Executive information systems

The executive of 1992 will be armed with the right information to make better, more informed decisions, a study conducted by International Data Corp. (IDC) suggests. The study shows that the use of executive information systems (EIS) is on the rise.

Executives surveyed by the Framingham, Mass.-based market research firm indicated that EIS is gaining importance and is increasingly needed.

EIS will be the fastest growing segment of the overall decision support system (DSS) market, IDC predicts.

DSS assists in management problem solving by using techniques such as modeling, data management, forecasting, reporting and graphics.

EIS is targeted at high-level management and was designed to provide timely, pertinent information to aid in decision making, thereby eliminating the need to sift through lengthy reports.

According to IDC estimates, the EIS market will reach more than \$1 billion in 1994 to \$1.15 billion in 1995, outpacing other DSS areas such as financial modeling, spreadsheet and analysis and other application software.

However, the financial modeling category will also grow, raising its stature as the largest DSS submarket. The aggregate DSS market is predicted to grow to more than \$450 million by 1992.

EIS represented only 11% of the DSS market in 1987. By 1992, IDC predicts that it will make up a full quarter of that market.

EIS is still fairly new to many executives. While sales of EIS packages are reportedly mounting, they are slowly being put to use by busy executives. (See story, page 31).

An IDC survey of executive ratings of personal computer functions showed that executives still favor spreadsheets and financial modeling over EIS.

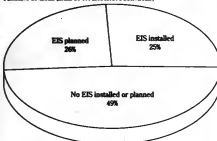
But advances in technology are making EIS easier for executives to use and learn, which should speed the technology's adoption.

EIS' bright future is further evidenced in a forthcoming IDC survey of 500 IBM sites, in which slightly more than half of the respondents indicated that they had EIS installed or that they planned to install such systems.

AMT CONTEXT

Many users planning for EIS

PERCENT OF SITES BASED ON 300 IBM SITES SURVEYED

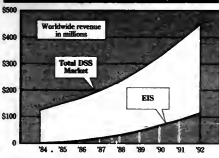


Outlook appears positive

NUMBER OF RESPONSES (BASED ON 48 FIRMS SURVEYED THAT USE OR PLAN DSS)

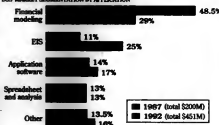


EIS to be 25% of DSS market by '92



Dollars will rival financial modeling

DSS MARKET SEGMENTATION BY APPLICATION

SOURCE: INTERNATIONAL DATA CORP.
© CHARTS: JOHN TOME

INSIDE LINES

The winds are blowing around DEC... and people who are hanging around find that the door is closing down. That was the message Ken Olson delivered during a mid-February product marketing confab, according to reports filtering down through DEC. The major corporate goal, according to the Decatur, is financial growth of 30% annually, no employment growth and price-cutting of 30% during the next three years. Among other tidbits making the rounds, Olson, sticking up to options outside the company, seemed unimpressed by DEC's marketing efforts and wants "innovation, leadership and aggressiveness." DEC will develop a strategy to educate the Big Eight accounting firms about DEC products; and VMS can be ported to a reduced instruction set computing (RISC)-based VAX.

We'll withhold judgment. A DEC official related last week's inside lines from that said DEC was negotiating with Truett Corp. to build a Micro Channel-based PC. However, the source of the information maintains that the DEC official made the statement, adding that "DEC did not want to close out its customers from Micro Channel products."

Server show thickness. In its partnership deal with Microsoft and Sybase, Ashton-Tate is reportedly explained from selling any OS/2-based multiterminal database management system other than the SQL Server all three are developing. But that will not stop Ashton-Tate from holding its breath by supporting a server from Interbase, in which it has an equity stake. The server will be distributed by Cognac.

A Novell approach for Gupta. Terry, Novell and Gupta Technologies are expected to announce a joint marketing and technology agreement that will give Novell a two-pronged database strategy. For users who wish to run DBMS software on a non-Unix-based system, Novell will push its own; Paradox SQL, iSQL and Paradox. For those opting for a dedicated database server, Novell will offer up Gupta's SQLbase, a more robust server system. The move is seen as aimed squarely at Microsoft, which is pushing its own SQL Server and LAN Manager operating system.

For whom the bell tolls. Sources close to DEC say the firm will officially retire the Vaxstation I/XTX on March 31. The workstation was introduced in January 1986 and was the first workstation in the industry to use MIT's X Window System. A DEC spokesman said the move would not surprise him, as it is shadowed in price-performance by the Vaxstation 3100, 3300 and 3500 models.

Privileged partner? Although IBM is late with AIX/370 for its customers, that does not affect the Open Software Foundation, says OSF Chairman David Terry. The OSF is using AIX as the core product for its alternative to an AT&T-standard Unix, and Terry said the original schedule is being met by IBM. The OSF has been receiving AIX Release 2 code and expects to receive Release 3 code in March.

Spotting Sparc. The consortium of chip vendors to promote Sun Microsystems' Scalable Processor Architecture (Sparc) has been incorporated. Sparc International, Inc. will be led by Cypress Semiconductor's Roger Ross, who also pioneered Motorola's RISC efforts before joining Cypress. According to Cypress' chief executive, T.J. Rodgers, Sparc International has been awarded the legal right to use the Sparc name. The next step is to ensure compatibility between all available versions of Sparc and the Unix operating system, Rodgers said. Sparc International is also composed of representatives from Fujitsu, Texas Instruments, LSI Logic and Roper Integrated Technology.

Will the next Bill Gates surface in the LAN market? Public offerings for high-tech companies have cooled since Seattle's Willy was made a billionaire by Wall Street, but Network General Corp., owner of the Sniffer diagnostic package, now is planning \$35 million public offering bid up to \$80 million by investors. With that and HP's buy into Com, it must be time for The Wall Street Journal to start writing about LANs. But if you want to see the story develop, give these tips to News Editor Pete Barabito by calling our hot line at 800-343-6474 or 800-879-0700.

THIS IS NO PLACE FOR SPACE INVADERS.



A business desk is no place to play games with space. So NEC built three serious machines with one mission in mind: optimum performance in a minimum space. Meet PowerMate® 1, PowerMate 1 Plus and PowerMate SX.

The PowerMate 1 and PowerMate 1 Plus get right down to business. They're industry standard. Powerful. Affordable. Both PCs race through spreadsheets, graphics and hundreds of other general office applications. And with six option slots and memory

expandable to over 10MB, they're ready for the inevitable result of all that tough work: Growth.

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